ASUS M930 Level 3 4 Trouble shooting Guide

Ver 1.0

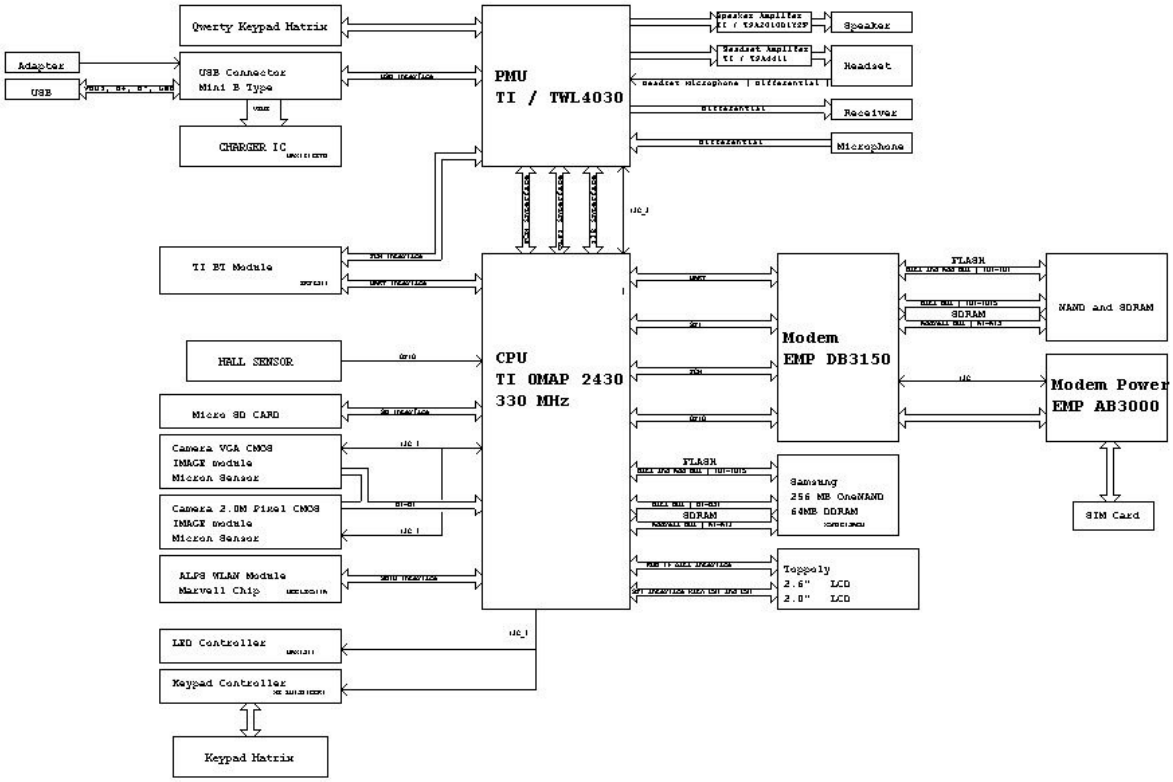
CONTENT

Forward

The purpose of the troubleshooting guide just implement for the failure on the MMI Testing. We will show several cases to discuss the repair reference procedure.

1. Over view

1.1 System block diagram



i. Figure 1. System Block Diagram

1.2 Power Domain Block

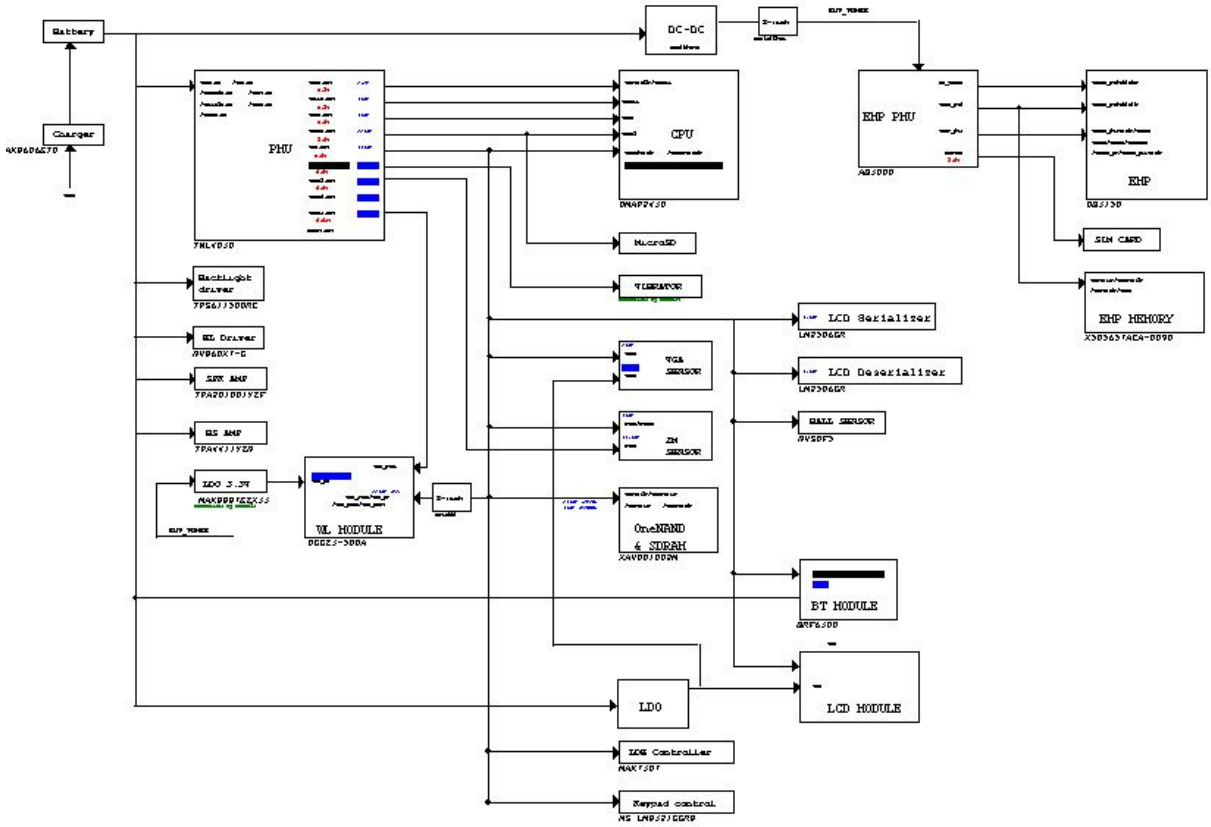
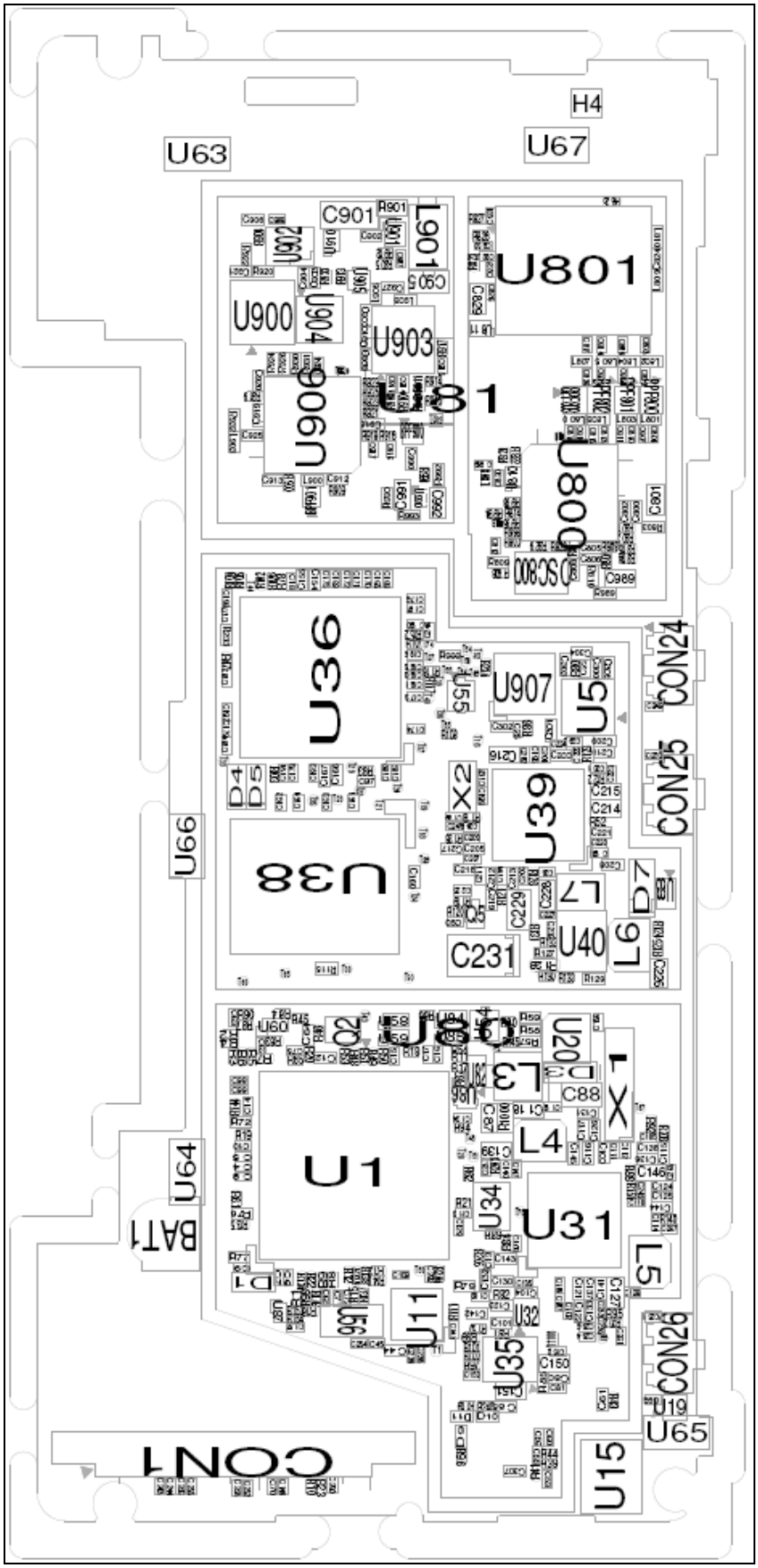
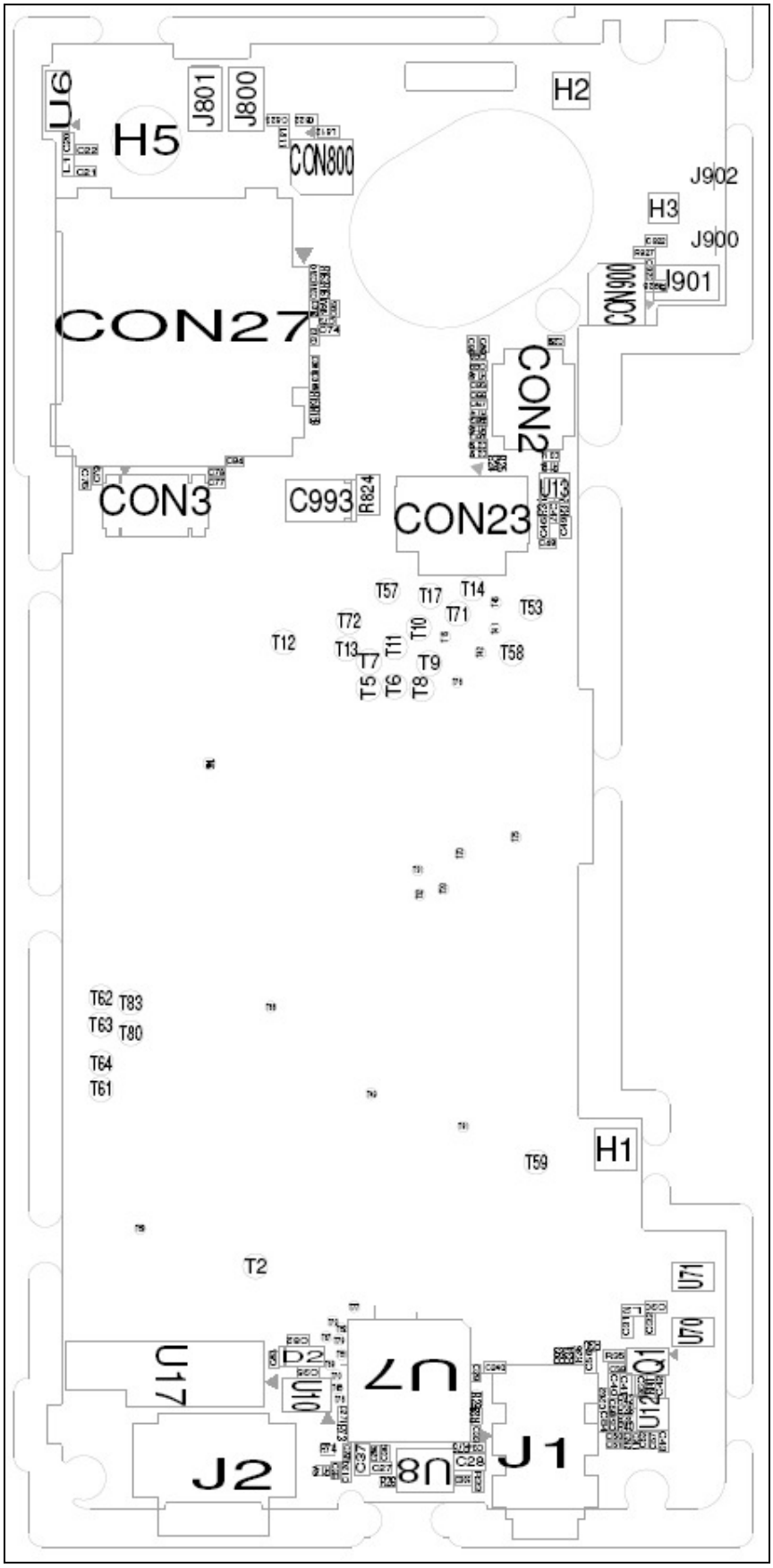


Figure 2. Power Block Diagram

1.3 Placement TOP View



1.4 Placement Bottom View



1.5 Specification

System	WCDMA 2100 MHz /EDGE/GPRS/GSM 850/900/1800/1900 HSDPA(3.6Mbps), EGPRS Class B, Multi-slot Class 10
Form Factor	Clam Shell
Dimensions	113 x 54 x 18.7 mm, 158g(with battery)
Battery	1100 mAh Lithium-Ion
Talk Time	5 hrs (GSM) , 3 hrs (WCDMA)
OS	Microsoft Windows® Mobile™ 6 Standard
Processor	TI OMAP® 2431 450MHz+ EMP U350
Memory	256MB Flash + 64MB SDRAM
Display	Main: 2.6" 65K ， TFT 400 x 240 Sub: 2.0" 65K, TFT, 240x320
Camera	2.0 Mega pixel FF + VGA

Connectivity	USB v2.0 , WLAN 802.11b+g, and Bluetooth® V2.0 + EDR
Expansion Slot	Micro-SD (SDHC support)
Music	MP3, WMA, AAC, and AAC+
Browsing	HTTP and WAP 2.0
Messaging	SMS, MMS 1.2, and Push E-mail
JAVA	J2ME (CLDC 1.1 + MIDP2.0), JSR185 JTWI
PIM & Utilities	Contacts, Notes, Calendar, Alarm, Calculator, File Manager, and MSN
Ringtone	128-ch Polyphonic ringer & MP3
Advanced	Dual display with full functions, iCam, Network Auto Configuration, BT remote controller.

2. SYSTEM Can't Boot

The main of the reason always focus on the component short and incorrect Power-on Sequence. In personal opinion, the power consumption of M930 can be check before the Power on Sequence. Please check the Power consumption of the M930 via power supply in R&D comment. It always judges SMT component defective issue: short, open. In general, power range will below 1mA in the deep sleep mode (Not touch the Power key of the device).

Please check the put low signal after we push the power key on the U32 pin 4.

3.1 Power-on sequence

A. The signal VBAT = power supply voltage

The VBAT can make sure the system power effective. Please check the voltage on the CON23 pin1.

B. V_CORE = 1.3~1.45, V_IO = 1.8,

The signal V_CORE and V_IO can make sure cpu power domain from PMU. Please check the voltage and try to eliminate component soldering issue (cold soldering, float mounting) on the below item:

R77、R19 / R202、R76、R72

C. V_PLL = 1.3，

Please check the voltage and try to eliminate component soldering issue (cold soldering, float mounting) on the below item:
R20.

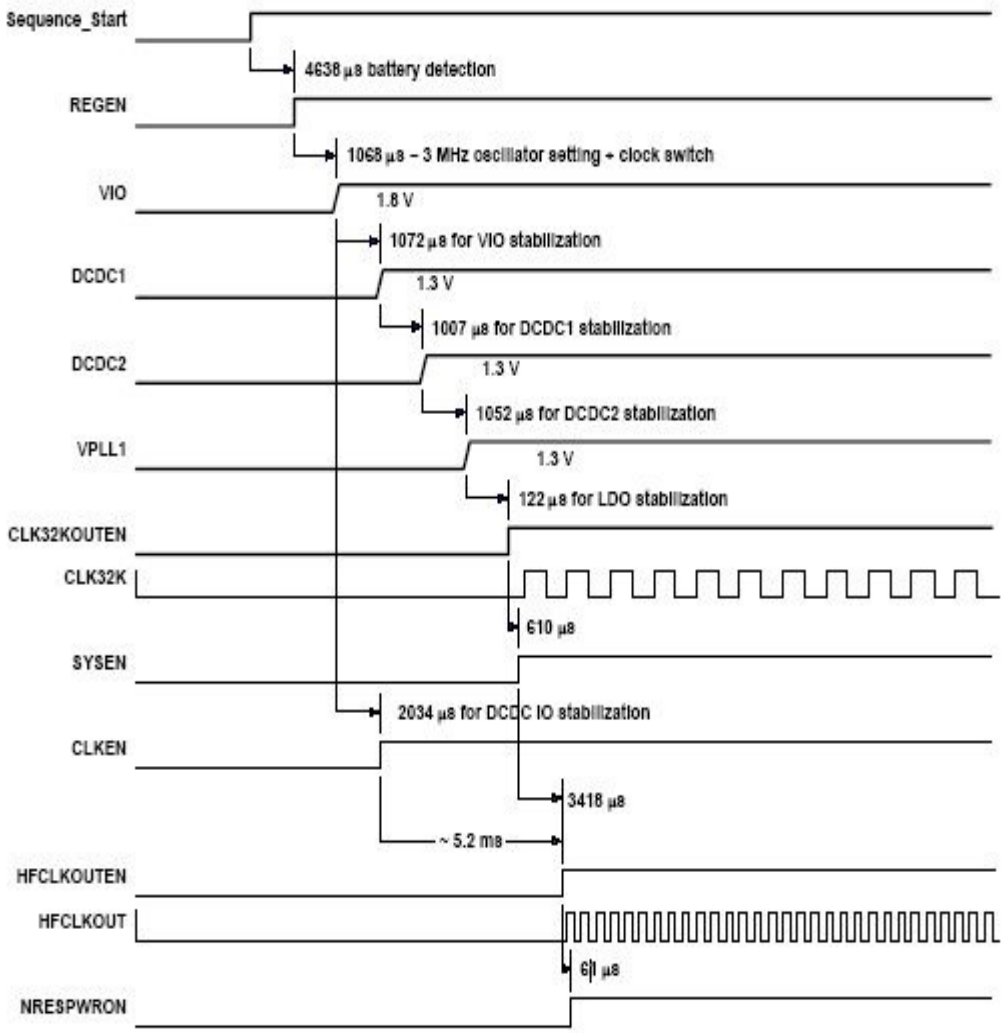


Figure 3. Power On Sequence

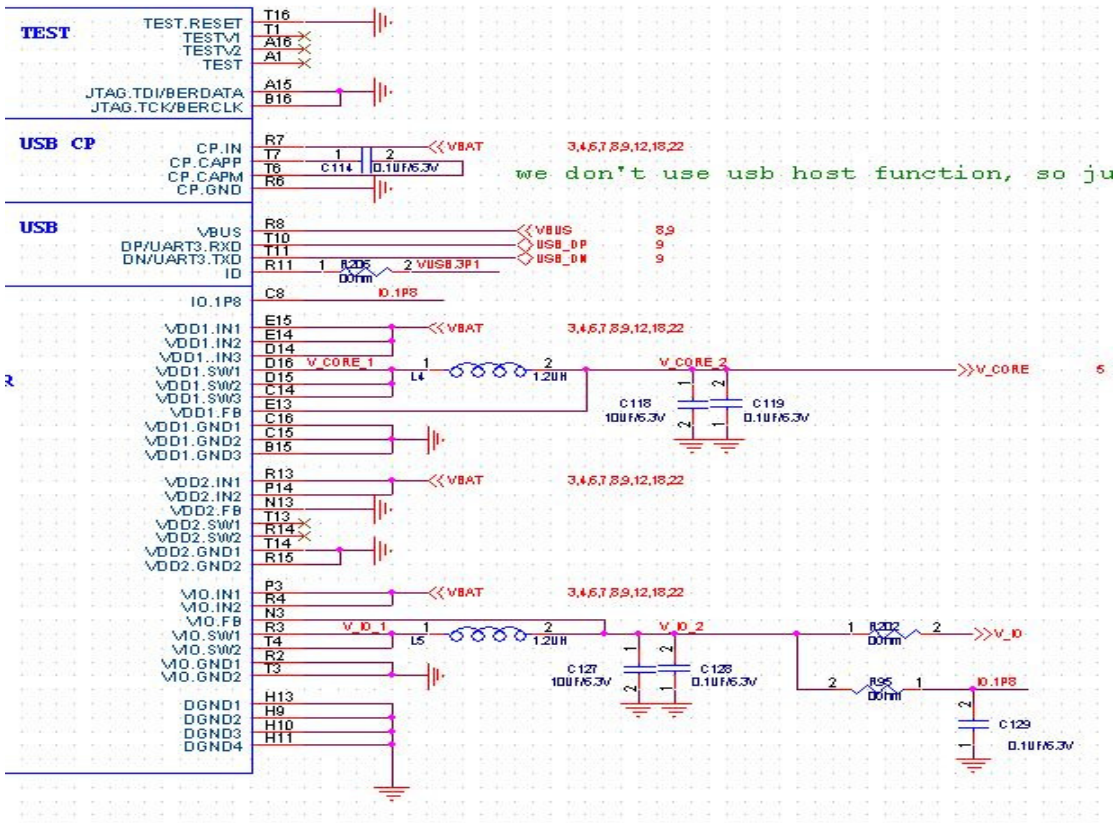
1.2 Others

1.If all of the signal have checked and still not improve the status. Please check the below signal.

C110.Pin1 32.768KHz

R151.Pin1&2 26MHz

2. Please check the insulation tape is well between VGA Camera and FPC side. Please avoid the short issue.
3. If still can't not improve the status, you should check the CPU and Memory status by X-ray machine. We can try to replace the CPU and memory which has updated the firmware with m930w reference version.



4.

Figure 4. PMU-01

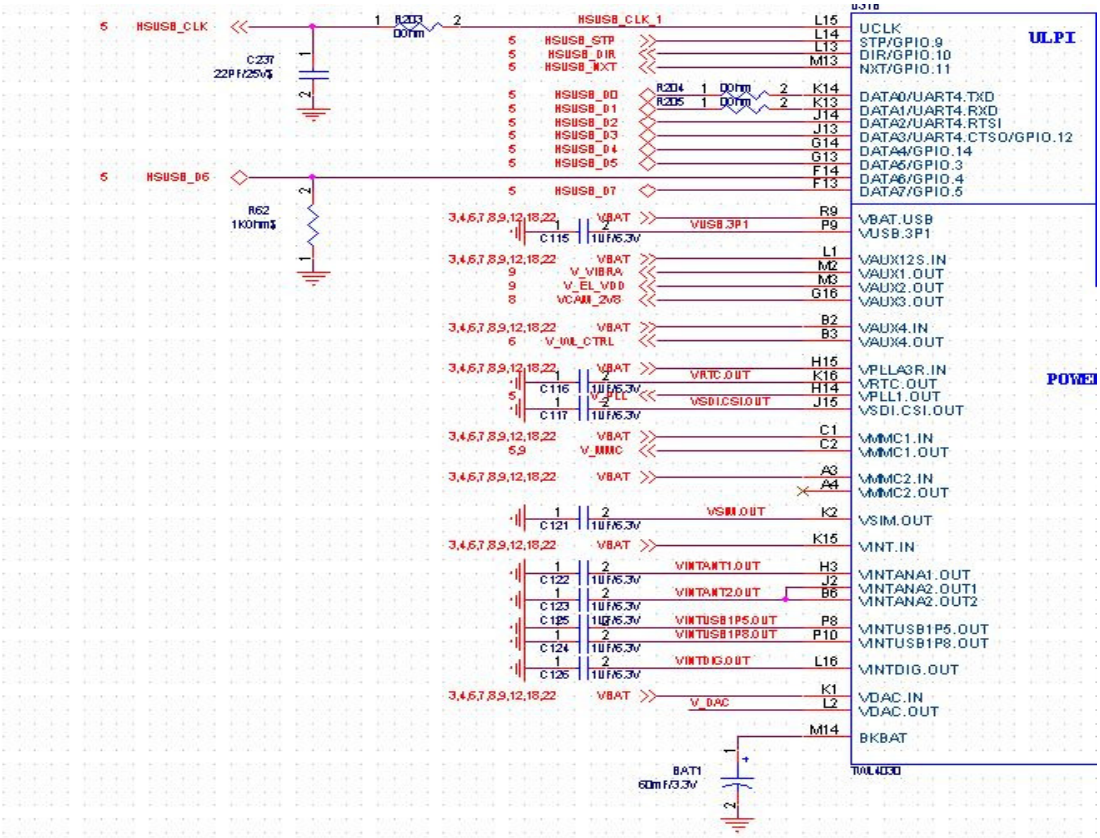


Figure 5. PMU-02

3. MMI Test item

4.1 Micro SD Test

The MMI test tool will be auto-executed by itself after we insert the MMI Micro SD card. If the phone can't get the data on the storage device, we should check the pathway on below process.

A. V_MMC 3.0V, CON27 Pin4
B. SD_DET# 0V, R54 Pin1.
C.

If item A fail, try to check open or short issue on the PMU.
If item B fail, try to check the CON27 Pin13 & Pin14.In the general; it will short when we put in the card. Please change the CON27 if the Pin13 and Pin 14 not short.

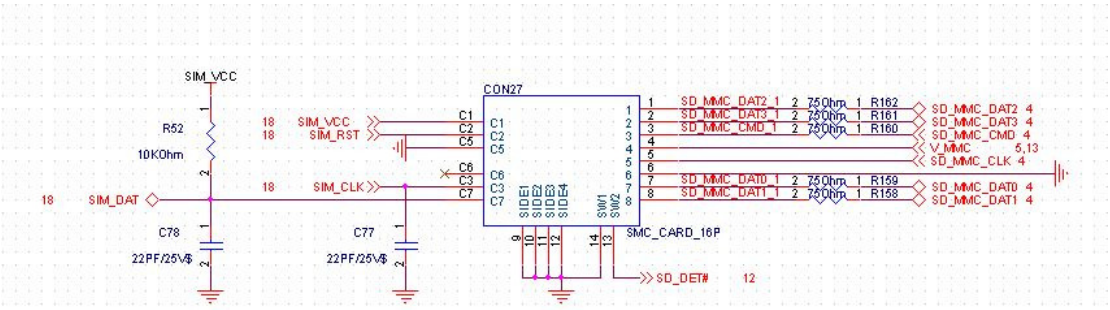


Figure 6. MicroSD + SIM Circuit

4.2 SIM Test

If SIM test fail, please check below items.

A. SIM_VCC 2.85V

If not please check the open or short on U39.

B. Please check the connector 27 on touch issue.

4.3 Display Test

The test item will focus LCM interface and backlight. If result is fail please check below item.

A. VIO_LCD 1.8V,
R143 both side.

B. LCD_VSYNC
LCD_HSYNC
LCD_PCLK video clock,
C238Pin1、C239Pin1、R111 both side on soldering issue.

C. If the main screen backlight wasn't executed, we can check below items on the LCD_PCB auxiliary board.
(LED_V+) 12.1V
MAIN_BL_EN 1.8V
If something wrong with the result which we found, please check U1 peripheral components and circuit.

D. If the secondary screen backlight wasn't executed, we can check below items on the LCD_PCB auxiliary board.
LED_V+ 6.2V
SUB_BL_EN 1.8V
If something wrong with the result which we found, please check U1 peripheral components and circuit.

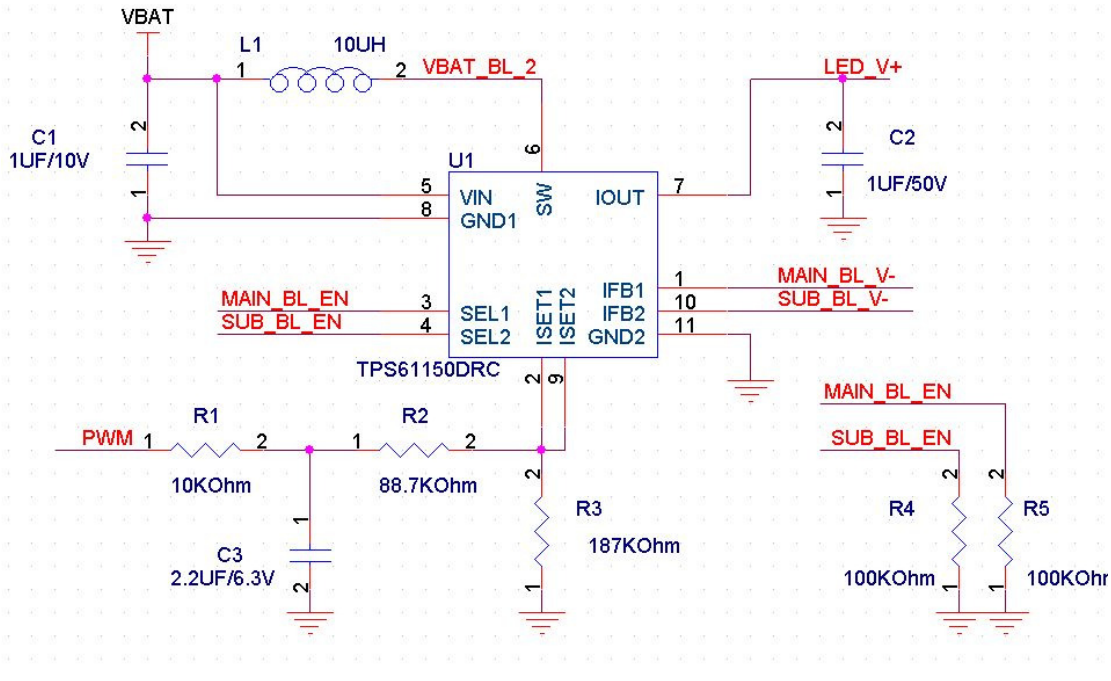


Figure 7. Backlight Driver Circuit (On LCD_PCB board)

4.4 Vibrator Test

If the vibrator can not working, please refer to below items try to eliminate the error.

U17 Pin1	3.0V
PMU (U31)	open / short

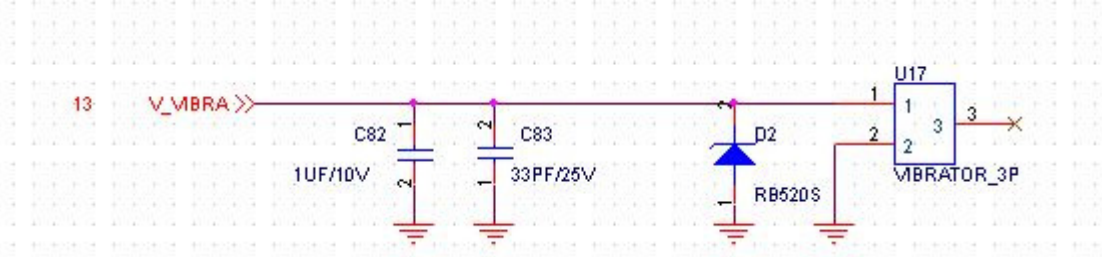


Figure 8. Vibrator Circuit

4.5 LED Test

We can check the RGB LED function and keypad LED via this test item. The indication LED will show: Red-> Green->Blue->kpd White LED->Red…….etc.

2.5.1 RGB Led fail

1. Please check R1, R2, R3 on soldering status.
2. Check the Pin9 and Pin 10 on the U5.
3. If the answer is no, please check the open/short on the CPU.
4. Replace the LED1.

2.5.2 Keypad LED fail

If the keypad LED will not executed. We can check below items on the LCD_PCB auxiliary board.

LED_V+	6.2V
SUB_BL_EN	1.8V (Figure 4)

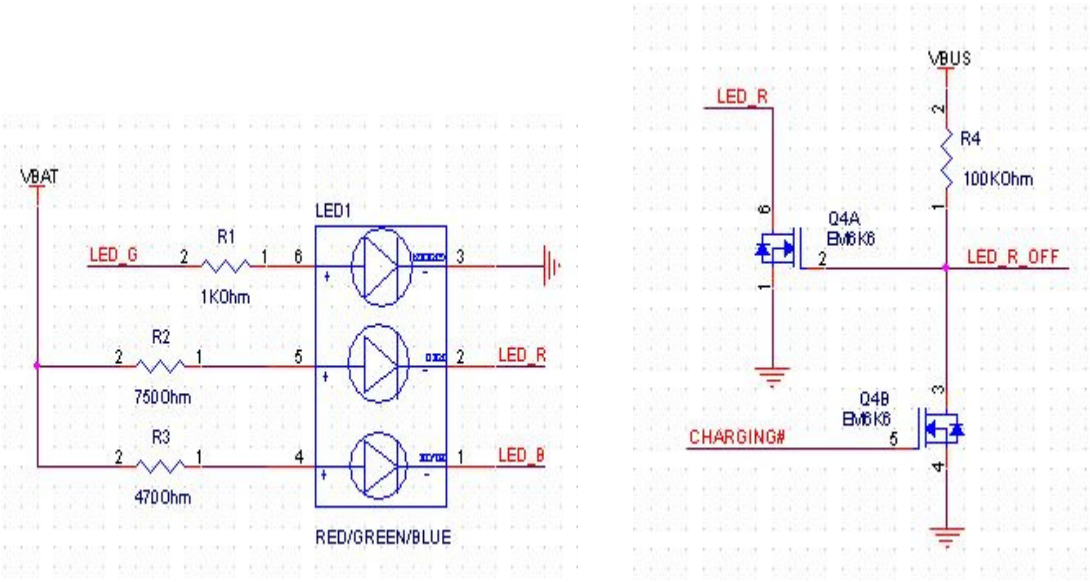


Figure 9. Indication LED Circuit -01

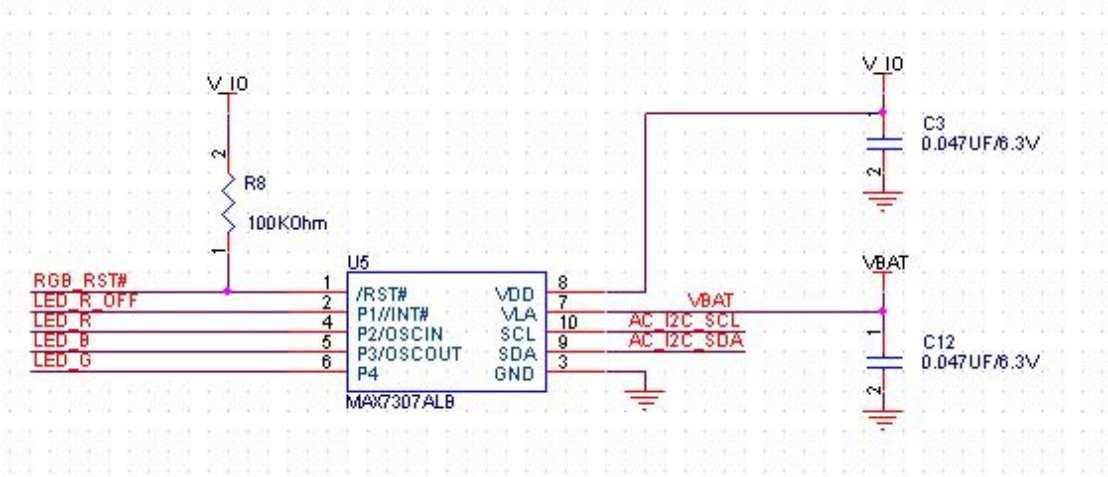


Figure 10. Indication LED Circuit -02

4.6 2M Camera & VGA Camera Test

We also test the item after assembly process. The main reason of the defective will focus on camera. Ex. Camera FPC fail 、 lens of the camera dirty 、can’t focus. If the pre-view image also shacking on the screen. Please check the defective or damage on the Coaxial Cable and follow procedure.

i. VCAM_2V8 2.8V, C69 Pin1.If not please check the PMU.

ii. V_IO 1.8V, CON2 Pin6

iii. 2M camera and VGA common signal bus
KEY_I2C_SCL、KEY_I2C_SDA、CAM_D0~D7

iv. 2M Camera ON

CAM_2M_MCLK and CAM_XCLK	Clock
2M_CLK_SHDN	Low
VGA_CLK_SHDN	High

v. VGA Camera ON

CAM_VGA_MCLK and CAM_XCLK	Clock
2M_CLK_SHDN	High
VGA_CLK_SHDN	Low

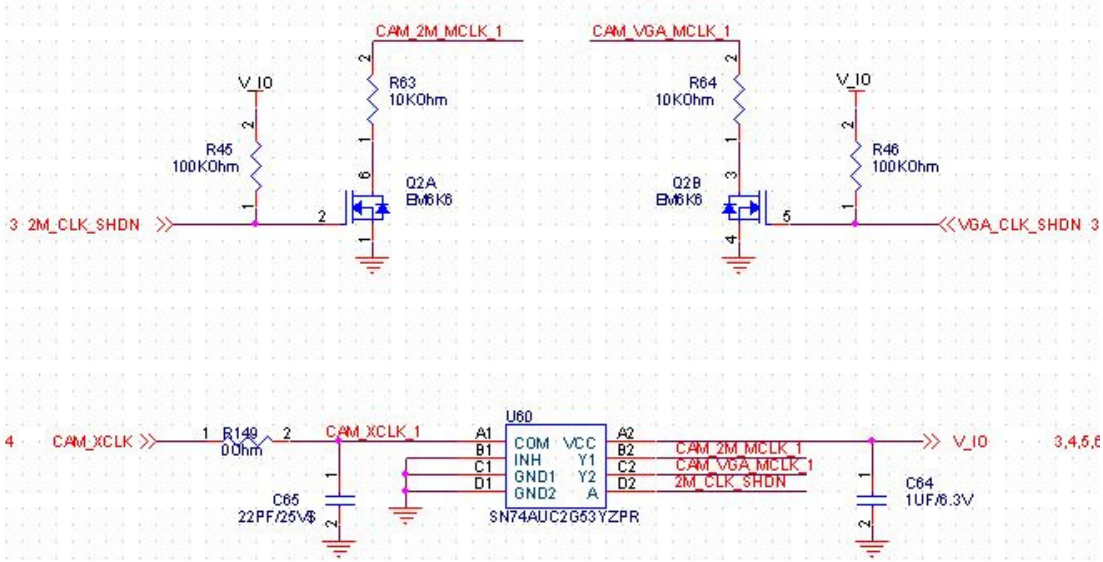


Figure 11. Camera control signal

4.7 SDRAM & Flash Test

Due to POP procedure, there will not test point be explored.

R72 1.8V

If you can get 1.8V then check the open/short of the memory by X-ray machine. Try to replace the chip.

4.8 Audio Test

4.8.1 Headset fail

Visual inspection earphone connector depends on soldering issue.

a. If headset signal can't be detected by phone. Please check the ， JACK_DET_1 and JACK_DET_2 1.8V. Please check the below components:R36、R93、C56、C240.

b. Audio no effect on R/L pathway

   Please check the related circuit on U12, , ex:C40、C41、R37、R38 both side to avoid soldering issue. Check the R30 Pin2 ➔是 High (1.8V)

c. Can't record

   Please check the signal from HSMICP and HSMICN, Please check the related component on soldering issue. ex. C51、C52、R35.

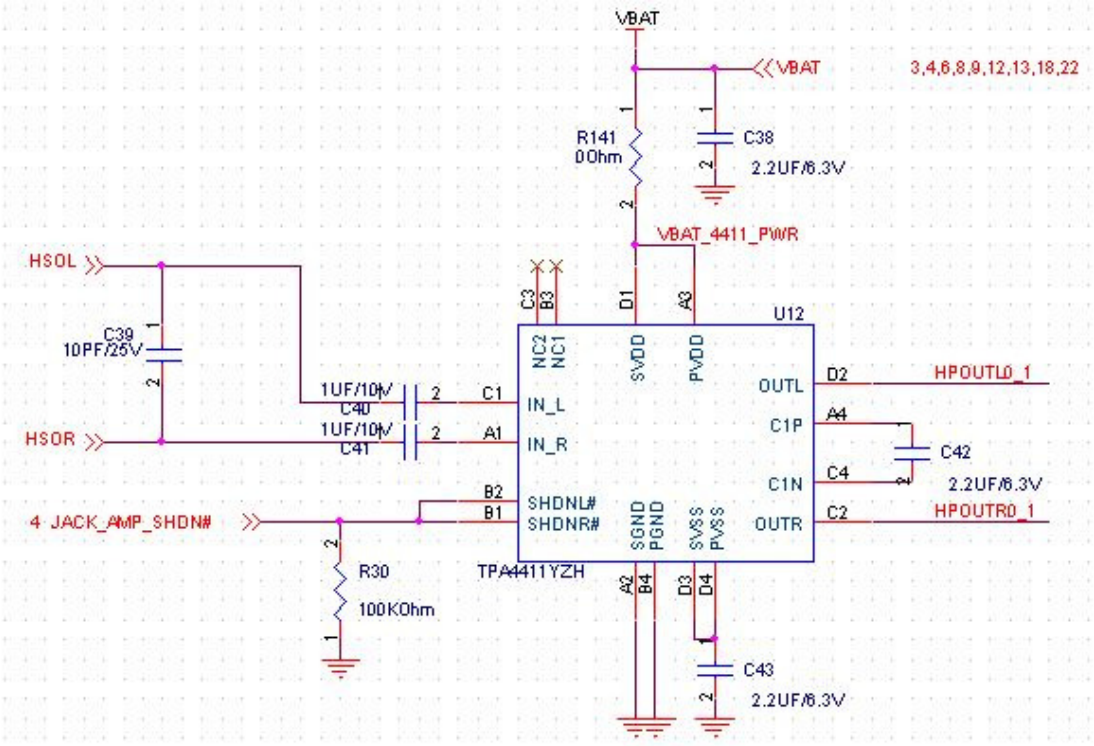


Figure 12. Headset Circuit - 01

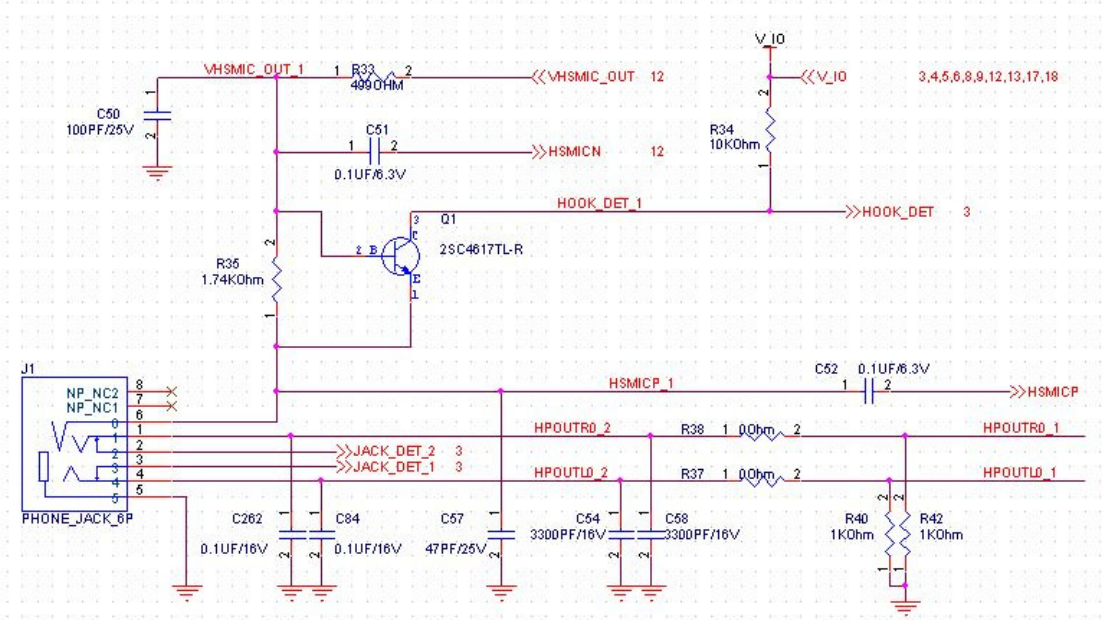


Figure 13. Headset Circuit - 02

4.8.2 Speaker

Most defective always related to the Speaker itself during the assembly period. Please check the below item.

Speaker NO Sound

R31、R32　　Audio signal (oscillate scope)

C46、C49　　Audio signal (oscillate scope)

If the C46、C49 can be check signal but SPK_P、SPK_N no be measured, please replace the U13 (Class-D Amp).

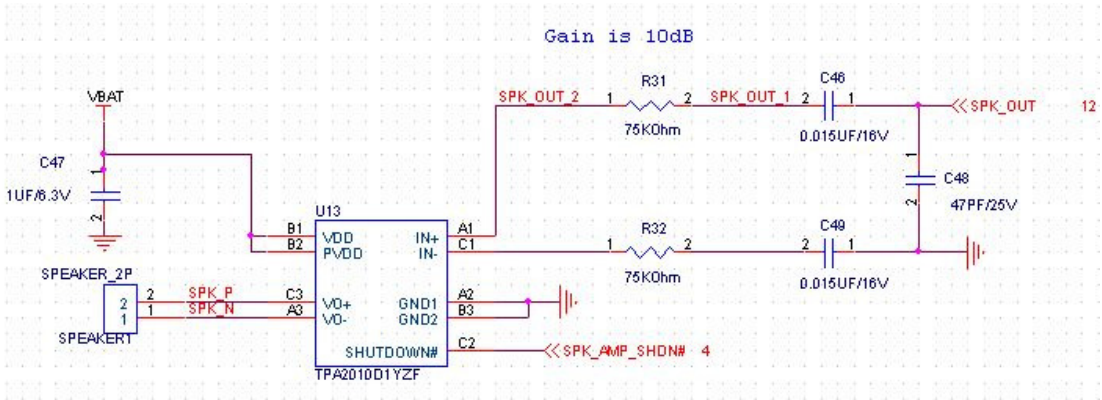


Figure 14. Class D Amp for speaker

4.8.3 On-Board Microphone can't record

If recording quality is poor ➔ U15 NG.

If recording function is fail, please check R39、R44、C55、C60.

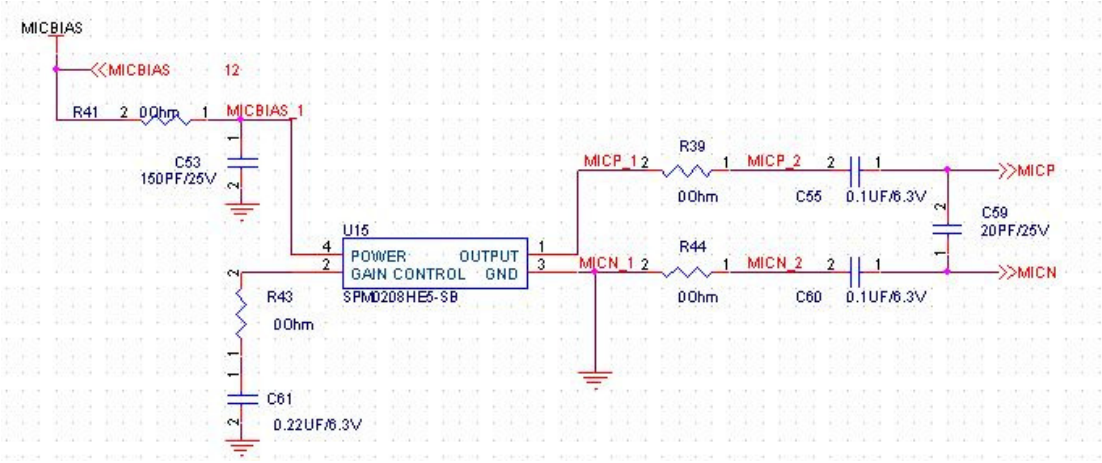


Figure 15. Microphone circuit

4.8.4 Receiver

If Receiver no voice, please check the C1、C2 on the LCD_FPC.

If still can't find any signal , please check Soldering issue(open / short) on the PMU.

Please replace the Receiver in the final step.

4.9 Keypad Test

Keypad is constructed by board-level test and assembly test.

4.9.1 Board level test:

Check SMT issue and detect the each rows and columns function on the keypad matrix via driver IC.

The pathway from driver IC to CPU via I2C protocol should be OK. We can use specify key group to verify the result.

The purpose of the assembly test:

Keypad FPC and Touch Feeling operated by end user. All of the buttons need be pressed.

4.9.2 External Keypad

We will use those functions on the U5 I/O controller IC from LCD_PCB. If you can feel the button has pushed after the function can not executed. Please check the signal **KPD_INT#** and the signal of the U5 by oscillate scope.

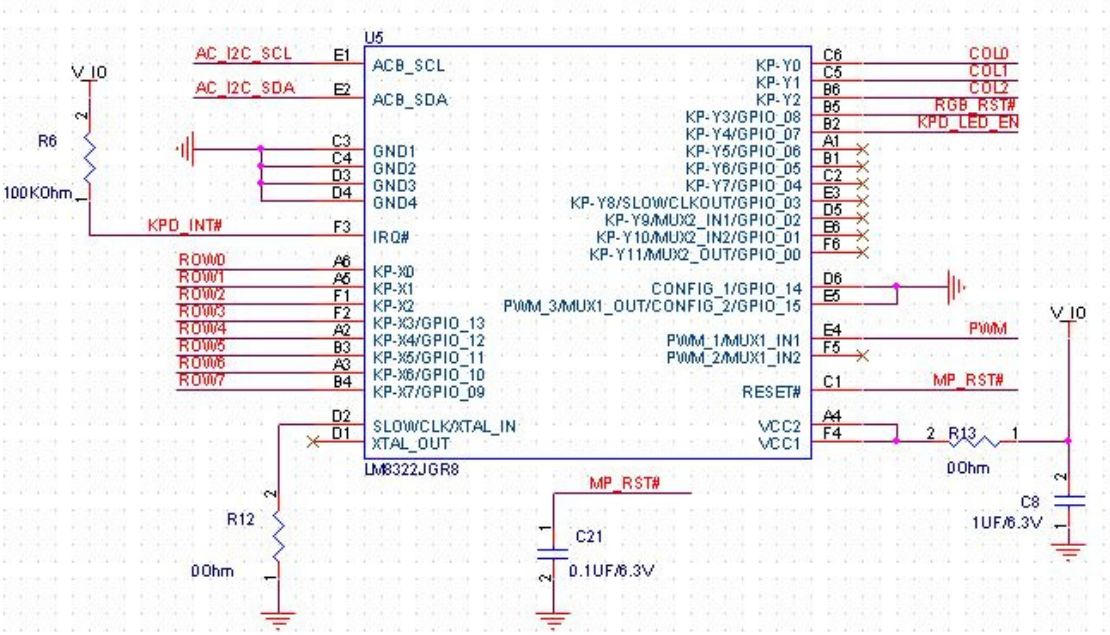


Figure 16. Keypad controller circuit(On LCD_PCB board)

4.9.3 Internal Qwerty Keypad

The signal control by U31. If you have any problem, try to check soldering issue(Open / Short) by X-ray.

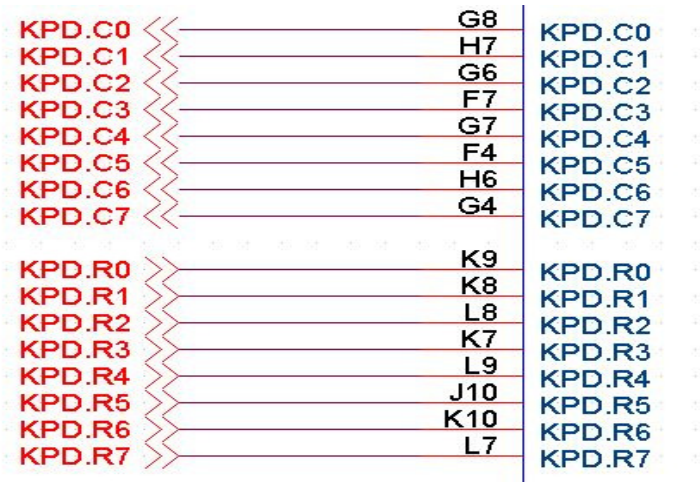


Figure 17. Qwerty Keypad controller circuit

4.10 BT Test

In general should be get follow bellow status

Check	C25		26MHz clock
Visual inspection	R80、R86		
Check	U55	Pin1	Low
Pin9/Pin10	Short		
Pin6/Pin7	Short		

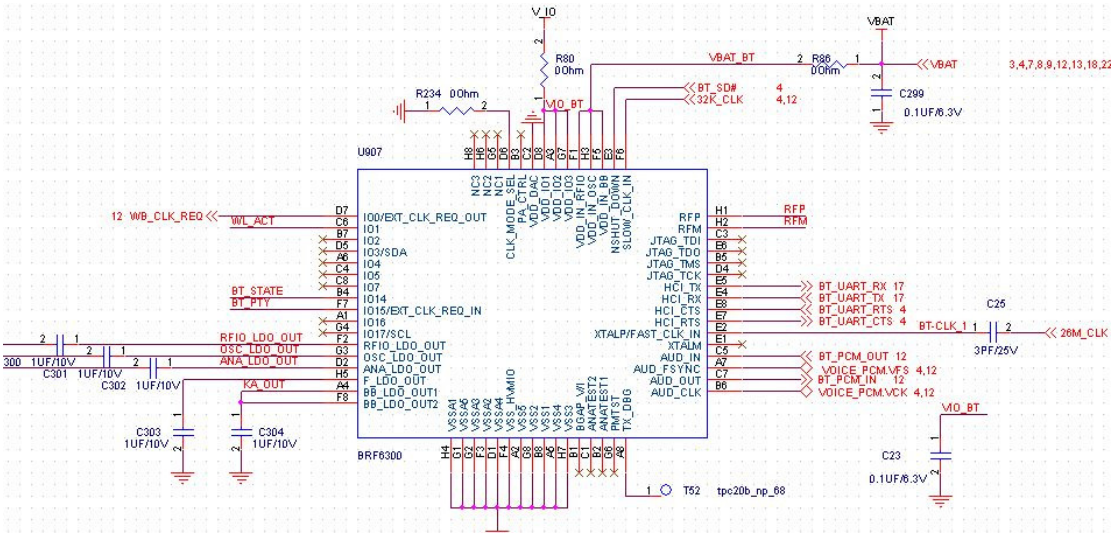


Figure 18. BT circuit

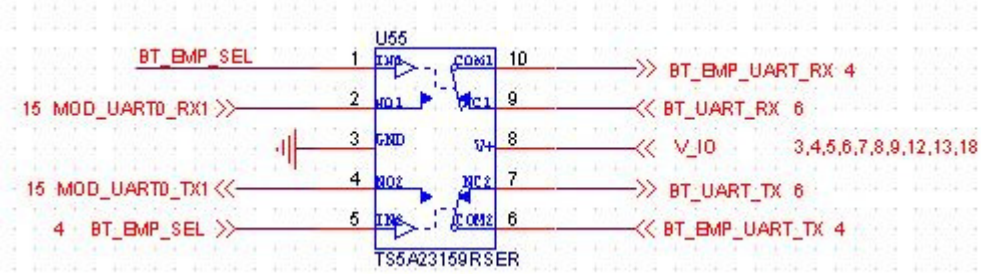


Figure 19. BT UART switch circuit

4.11 WiFi Test

In general should be get follow bellow status

D. Check R74 1.8V
E. Check U10 Pin3 1.8V (High), If the result is true please check the U10 on the soldering issue.
F. Check U8 Pin3 1.8V (High)
Pin5 3.3V
G. Check the signal of the R29 will get the dynamic wave by oscillate scope.
H. Check R75 3.3V
R142 2.85V

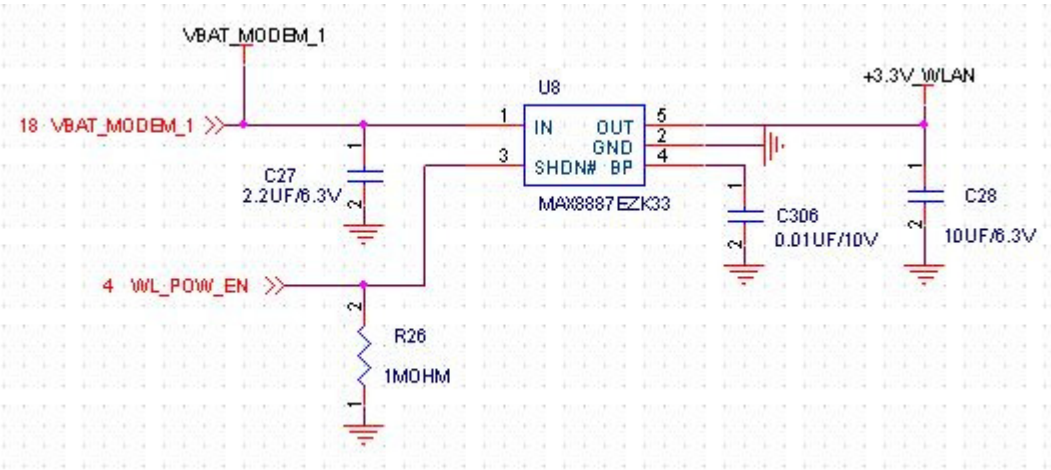


Figure 20. WiFi PA Power circuit

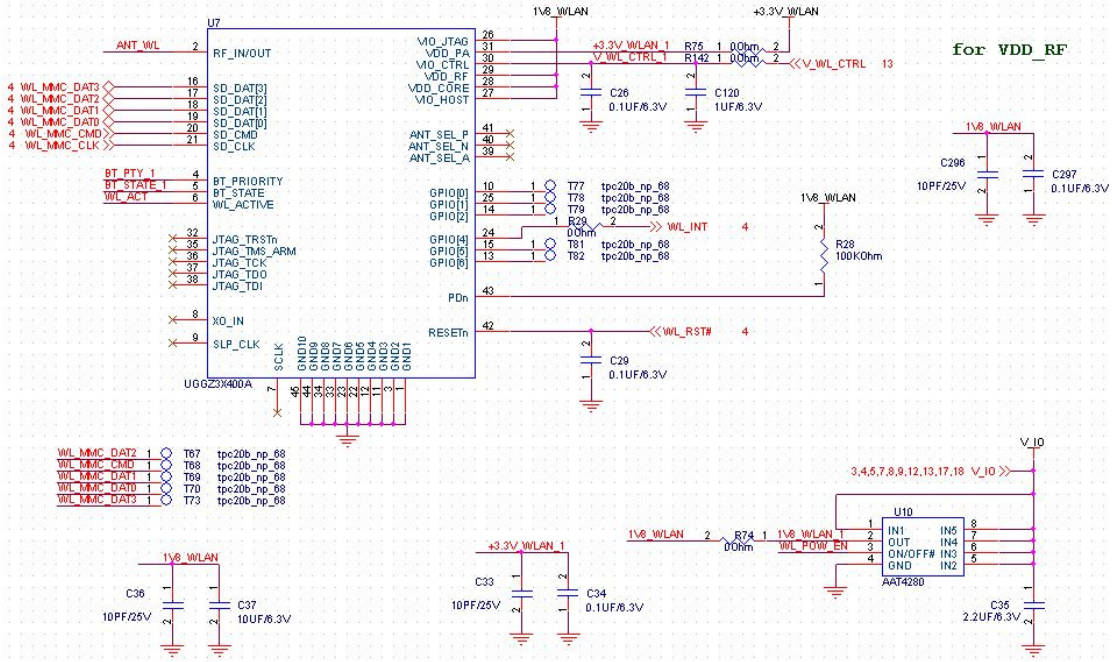


Figure 21. WiFi circuit

5. Phone Off

In the Vega2, the modem switch is control by CPU via UART/SPI interface command.

It won't cut off the modem power in the physical layer, we also check the procedure step by step:

5.1 Modem Power

1. VBAT_MODEM 3.6V ~ 4.2V
2. VBAT_MODEM_1 3.6V ~ 4.2V
3. VBAT_MOD_EN 1.8V(High)
4. Check the schematic related of the U40, try to rework with the U40.

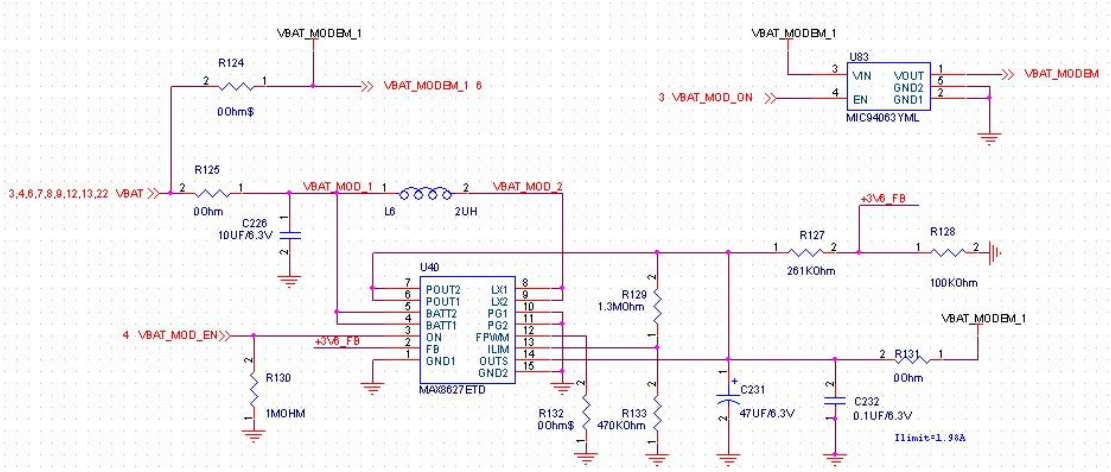


Figure 22. Modem Power circuit

5. VDDD_1V5 1.5V
   VDDE_1V8 1.8V
   VDDC_2V75 2.75V
6. MOD_POW_ON 1.8V(?)
7. RTC_CLK 32.768 KHz Clock
8. If Item5~7 will Ok, please replace the U39 to improve the condition.

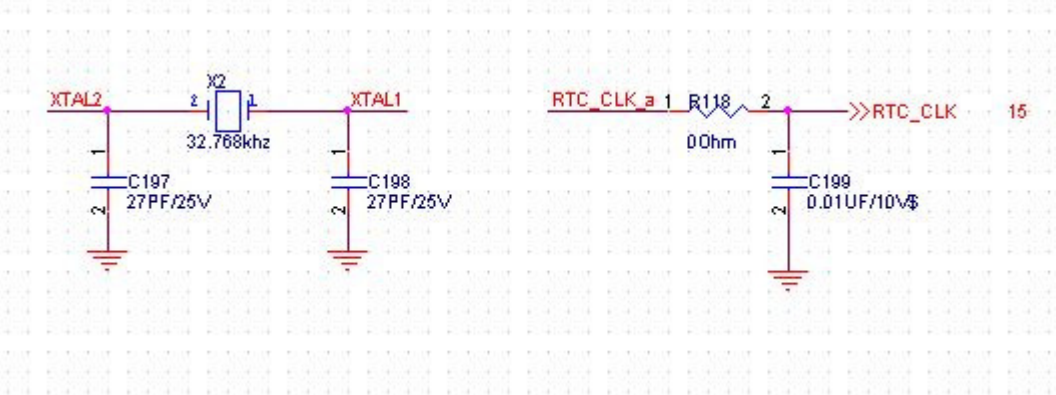


Figure 23. Modem RTC circuit

5.2 Modem to System interface

The main inter phase which connected from CPU and Modem is constructed by U58 and U59. Please check the soldering condition on the BGA package of the chips(U58、U59) by X-ray detection.

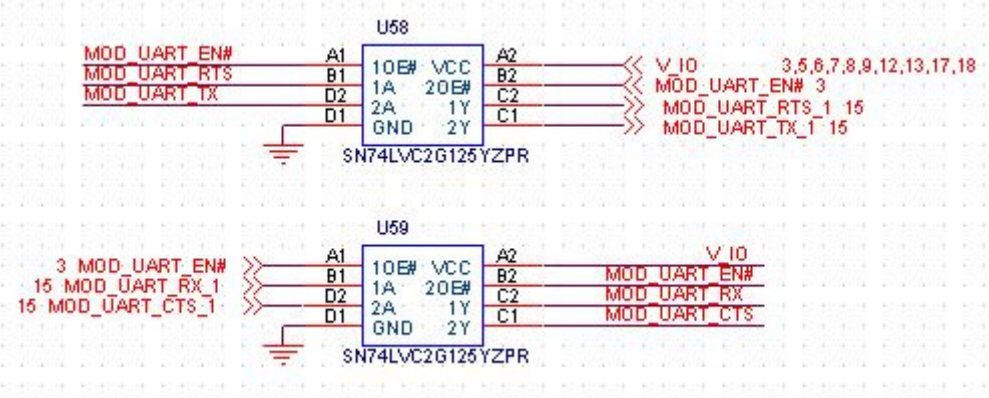


Figure 24. Modem UART interface

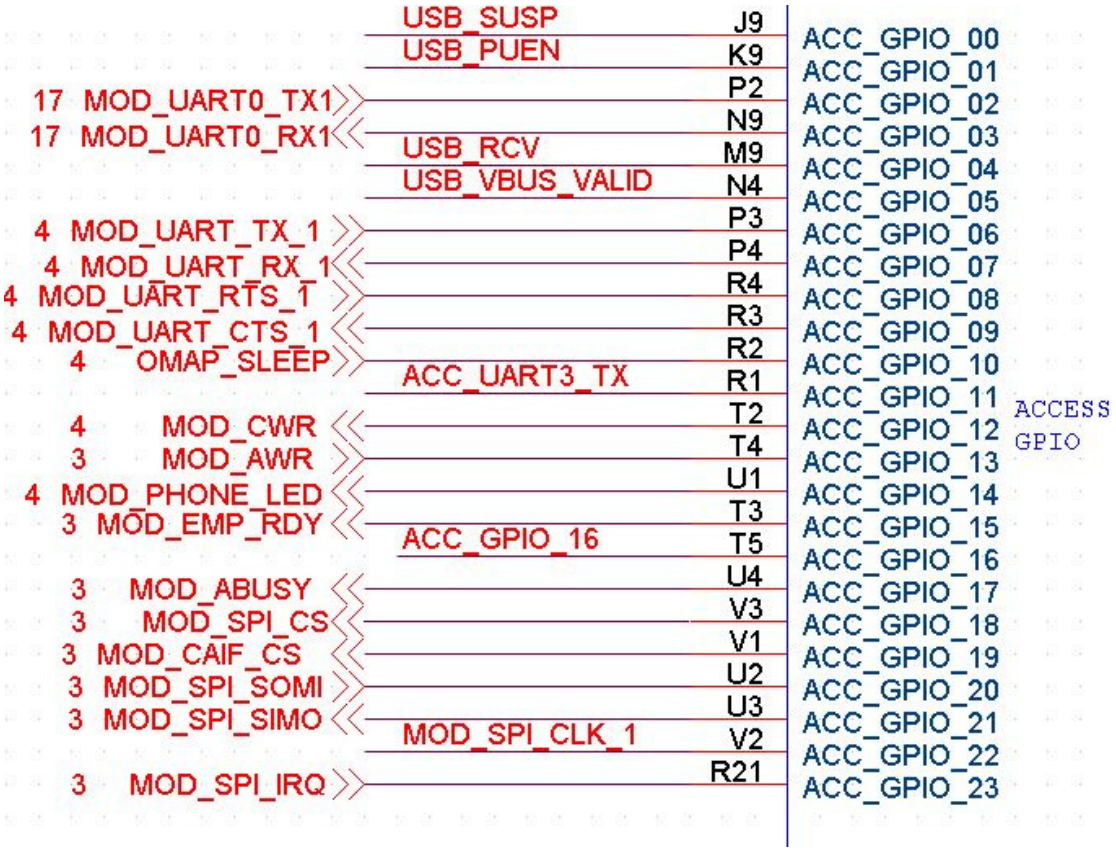


Figure 25. Modem/CPU interface

6. Power consumption

We will support two mode to check our device in the power consumption test. In the Power Off mode, the value should be approach 0 mA. Insert the SIM card and Micro SD before the power on .The Sleep mode active tool will be automatic executed by itself in the Micro SD card. It will take 3 second when the screen turn to blend, system convert to sleep mode. The value should be approach 2~3mA in the lowest level.

If there out of the above range, please check the value step by step：

6.1 Power Off Mode

If we found the value over the range in the Power Off mode, please follow below check point step by step.

A. V_CORE 0V
   V_IO 0V
B. Remove the R824 to determine the short issue from RF IC Side.
C. Remove the R125 to determine the short issue from Modem IC Side.
D. Check IC group on the VBAT network to determine Short defective of the component.

6.2 Sleep Mode

If we found the value over the range in the Power Sleep mode, please follow below check point step by step.

A. Check R76 by Amp meter. 250uA ↓
B. Check R77 by Amp meter. 150uA ↓
   a. Please check the soldering condition on the BGA package of the CPU by X-ray detection.
C. Review all of the Chips on each power network of the device. Which part will short with GND is our direction of the repair. But still a huge working to find the root cost. We will suggest the chip priority : BGA / CSP package→IC→….
D. The short with GND condition is not obviously, we can use the temperature different to help us judge that soon.

7. RF Repair requirement

7.1 Software requirements：

U250_U360_E_Tool

Modem Firmware：Latest Version(include：APP and ACC GDFS File)

7.2 Hardware requirements：

RF Connector and RF cable

High Frequency Probe with DC Block

(connect with a 0603 1μF capacitor)

Power Supply Contact

7.3 Equipment：

PC

Test Fixture

Oscilloscope

Communication tester：Agilent 8960, CMU200 or Anritsu 8820

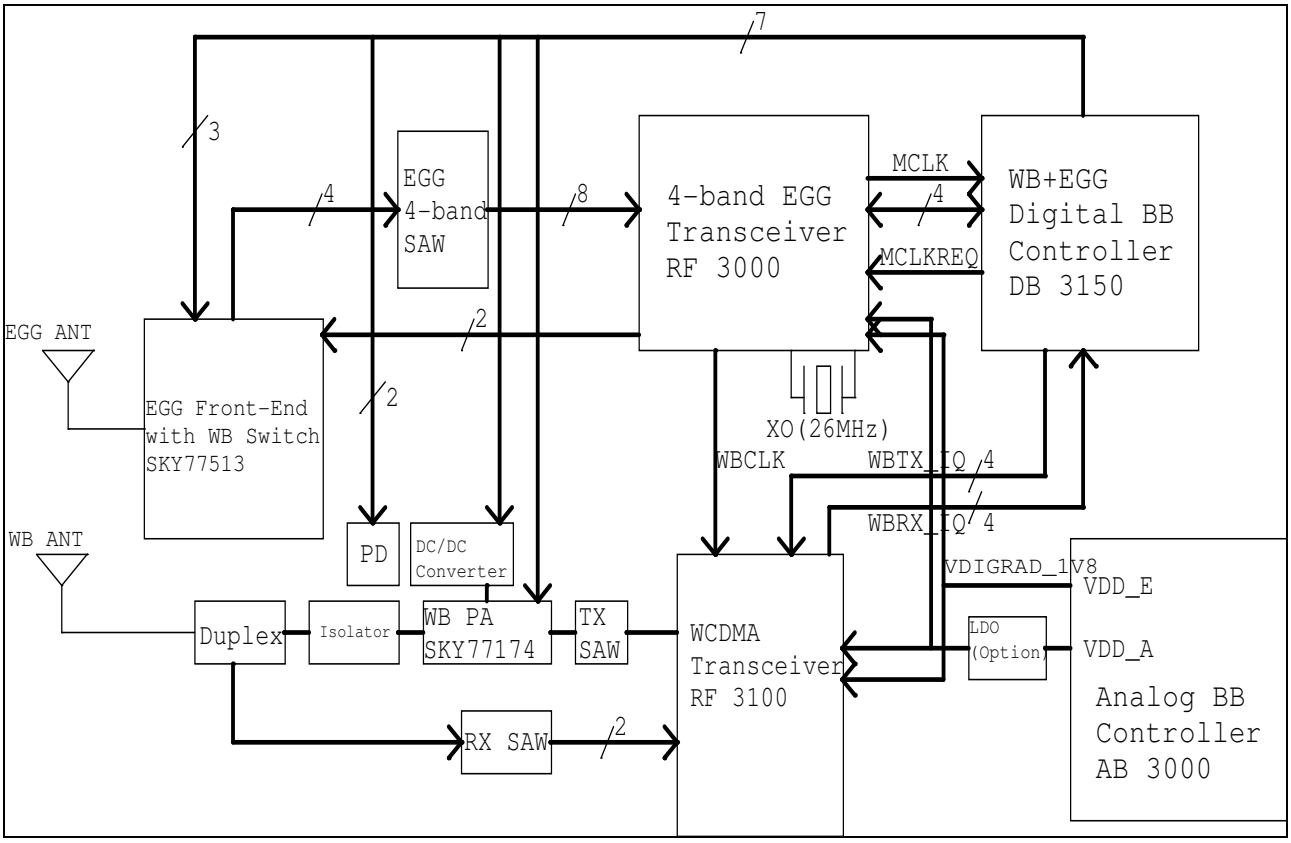
Digital Multi Meter

Power Supply

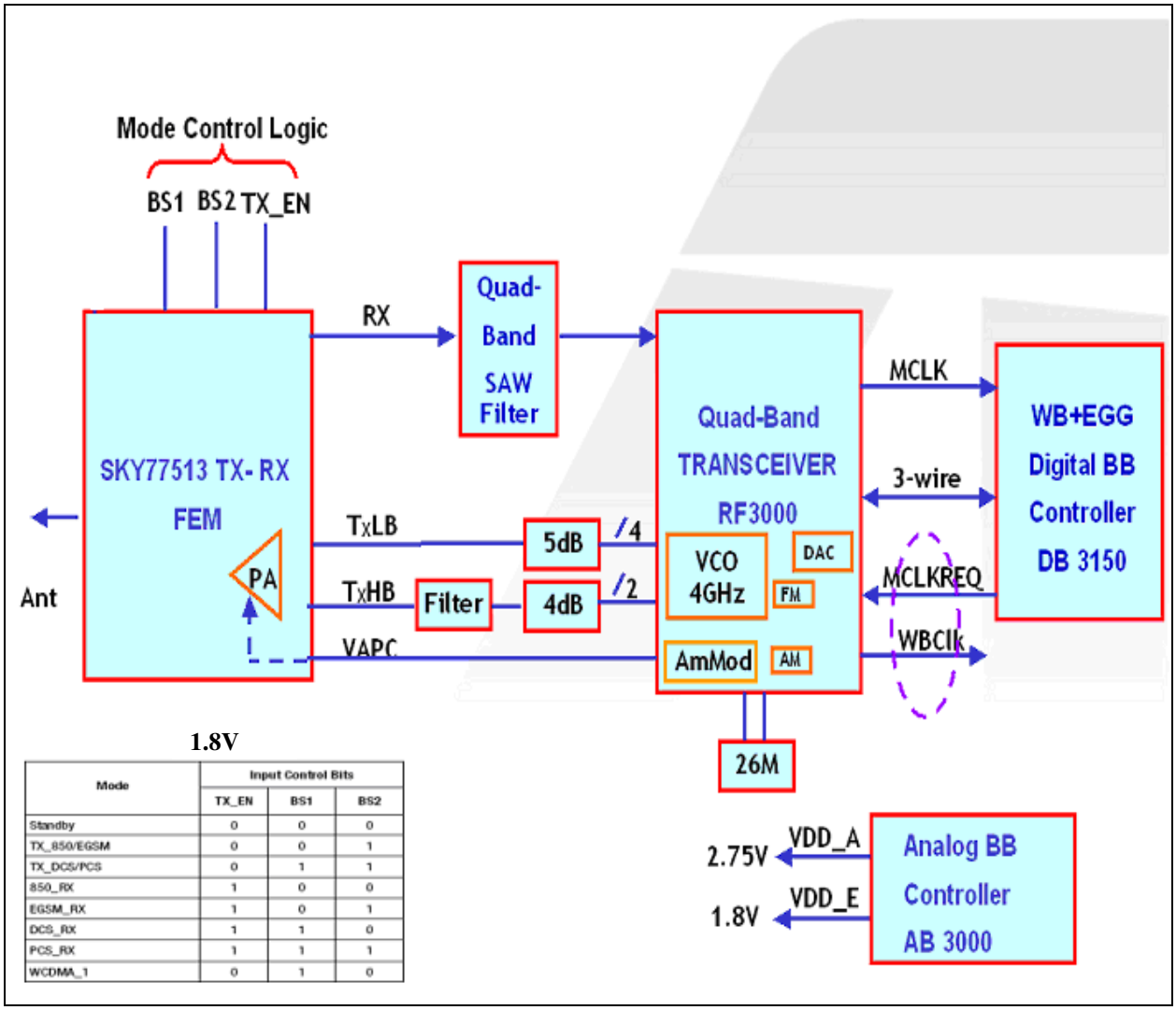
Spectrum Analyzer (up to 3.0 GHz)

8. Block Diagram

8.1 RF Block Diagram of VEGA2



8.2 GSM/GPRS/EDGE(EGG) Block Diagram



Mode	Input Control Bits		
	TX_EN	BS1	BS2
Standby	0	0	0
TX_850/EGSM	0	0	1
TX_DCS/PCS	0	1	1
850_RX	1	0	0
EGSM_RX	1	0	1
DCS_RX	1	1	0
PCS_RX	1	1	1
WCDMA_1	0	1	0

Key Components

➢ TX- RX FEM (U801)

1. Quad-Band GSM/GPRS/EDGE
2. Polar EDGE modulation
3. Low input power range ~ 0 to 6 dBm

➢ Tx attenuator

1.U811：5dB
2.U810：4dB

➢ RXSAW Filters

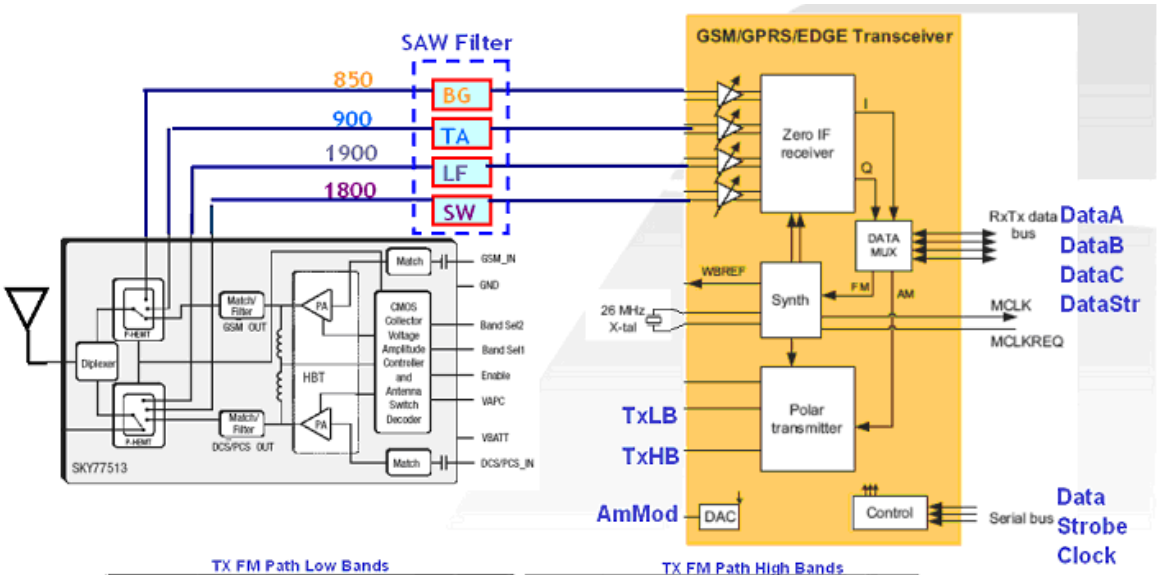
1. 850：BPF800 (BG)
2. 900：BPF801 (TA)
3. 1800：BPF803 (SW)
4. 1900：BPF802 (LF)

➢ RFIF_TRANSCEIVER_RF3000 (U800)

1. Zero-IF receiver
2. Polar modulation transmitter

➢ 26MHz Quartz Crystal (OSC800)

1. C_L=15pF 10ppm



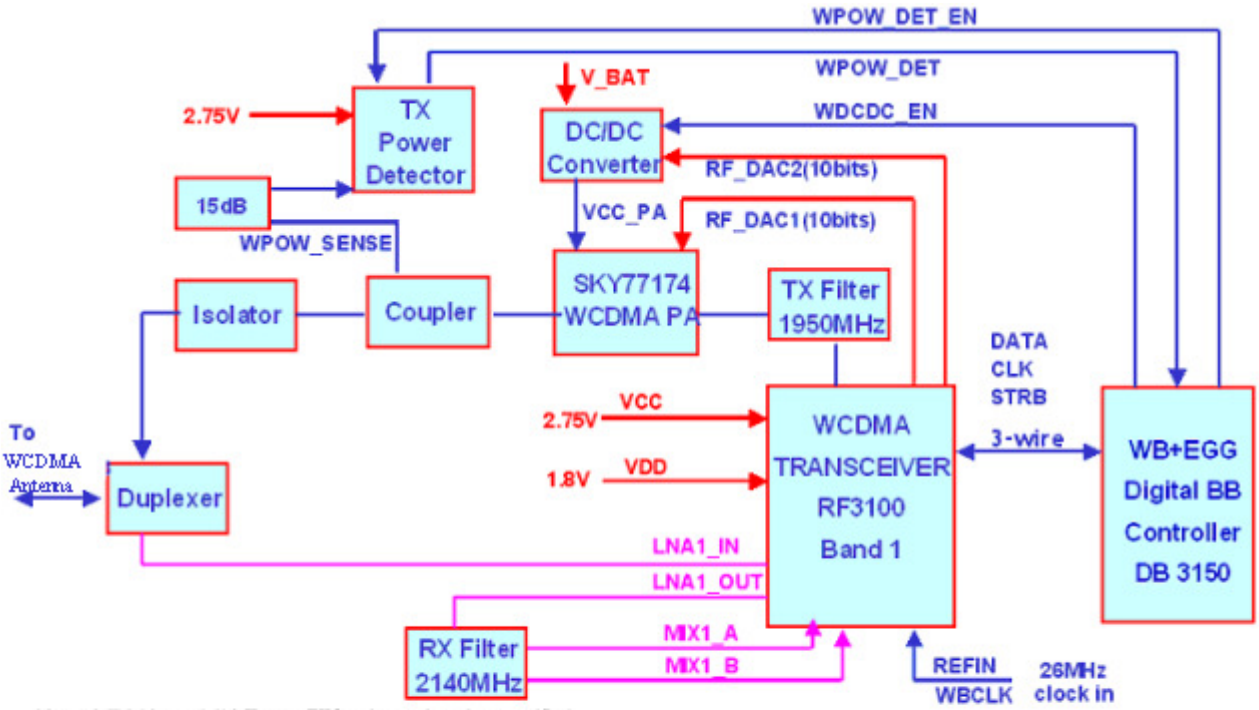
TX FM Path Low Bands

PTxOL	TX output power levels, TxPath enabled, 50 Ω load	PowLev[2:0]			
		111	7.5	9.5	11.5
		110	5.5	7.5	9.5
		101	3.5	5.5	7.5
		100	1.5	3.5	5.5
		011	-0.5	1.5	3.5
		010	-2.5	-0.5	1.5
		001	-4.5	-2.5	-0.5
		000	-6.5	-4.5	-2.5

TX FM Path High Bands

PTxOL	TX output power levels, TxPath enabled, 50 Ω load	PowLev[2:0]			
		111	6.5	8.5	10.5
		110	4.5	6.5	8.5
		101	2.5	4.5	6.5
		100	0.5	2.5	4.5
		011	-1.5	0.5	2.5
		010	-3.5	-1.5	0.5
		001	-5.5	-3.5	-1.5
		000	-7.5	-5.5	-3.5

8.3 WCDMA Block Diagram



V_{CC} = 2.7V; V_{DD} = 1.6V; T_{amb} = ETC unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
LNA, pins LNA1_IN to LNA1_OUT						
G_p	Power gain	high gain mode	14.5	16	17.5	dB
		low gain mode	-1.5	0	1.5	dB

Key Components

➢ Duplexer (U900)

1. TX to ANT Insertion Loss (1920...1980MHz) 1.2dB
2. ANT to RX: Insertion Loss (2110...2170MHz) 1.9dB
3. TX to RX: 57dB

➢ WCDMA Transceiver RF3100 (U906)

1. Single band application (UMTS band1)
2. 3GPP release 5, power class 3
3. Zero Intermediate Frequency

➢ WCDMA PA (U903)

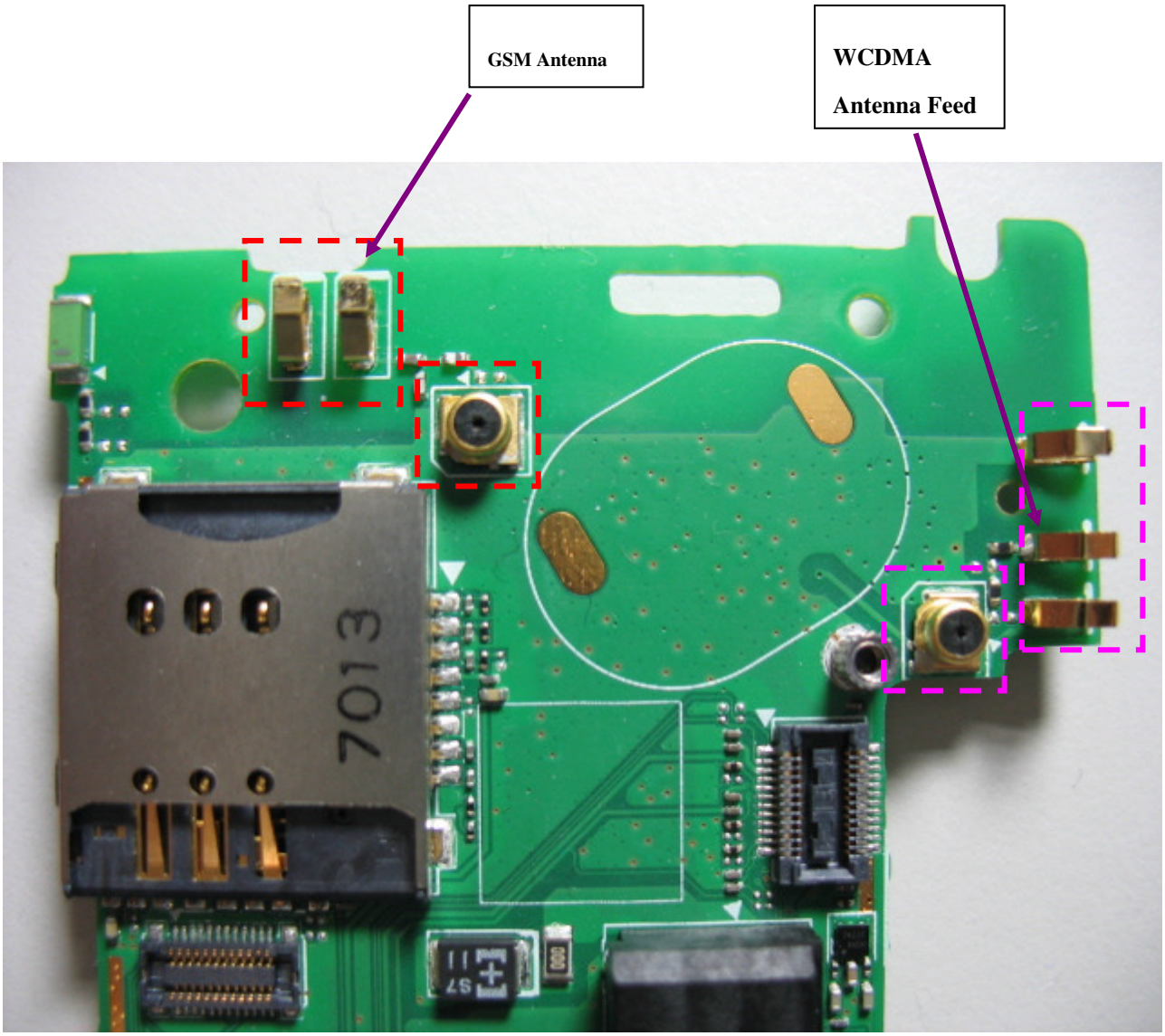
1. VCC：2.75V
2. VDD：1.8V

➢ Coupler (U905)

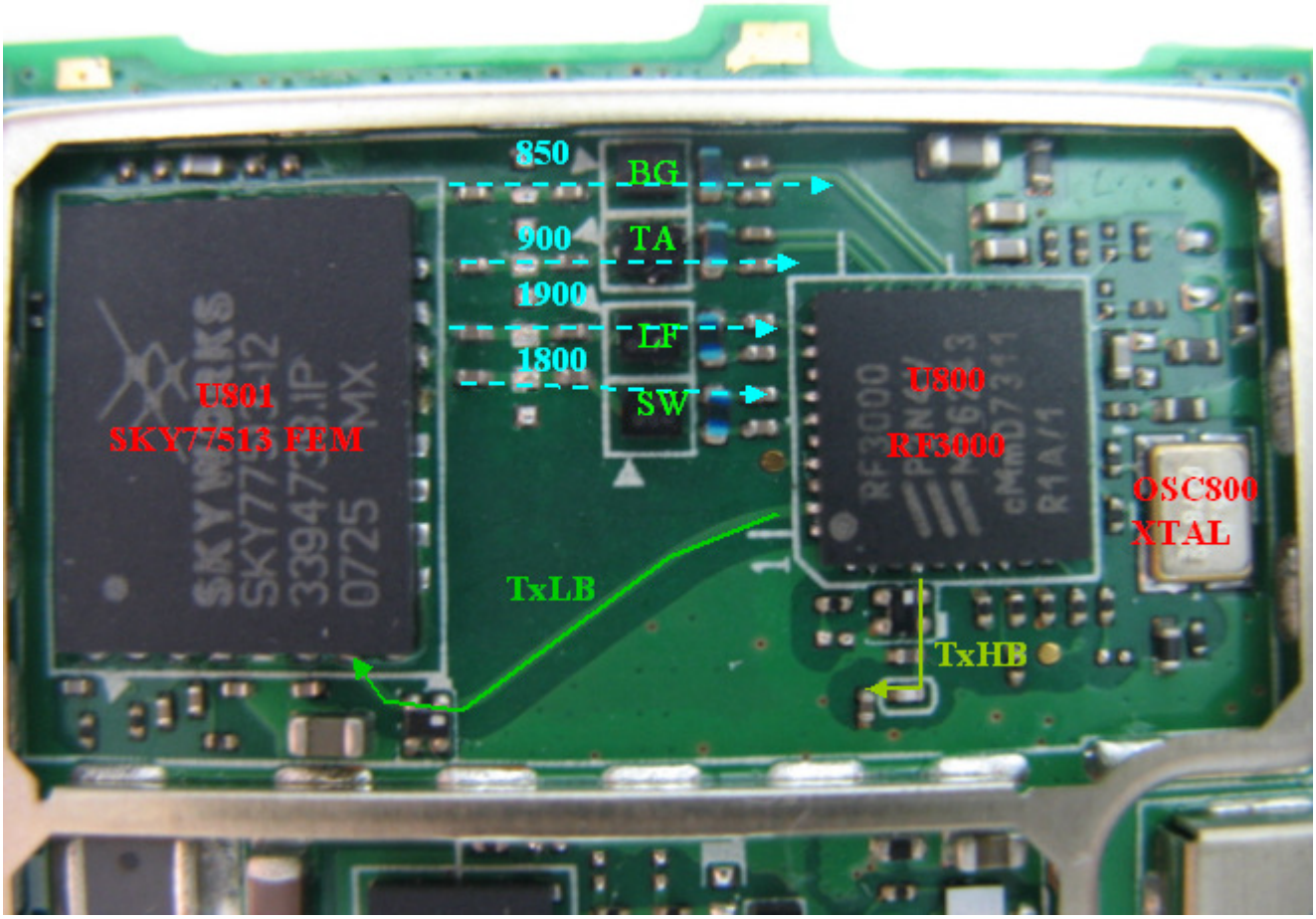
Coupling：19.30 ± 1.00 dB

9. GSM & WCDMA RF Tx/Rx Path

9.1 Backside Antenna Area



9.2 EGG Tx/Rx Path

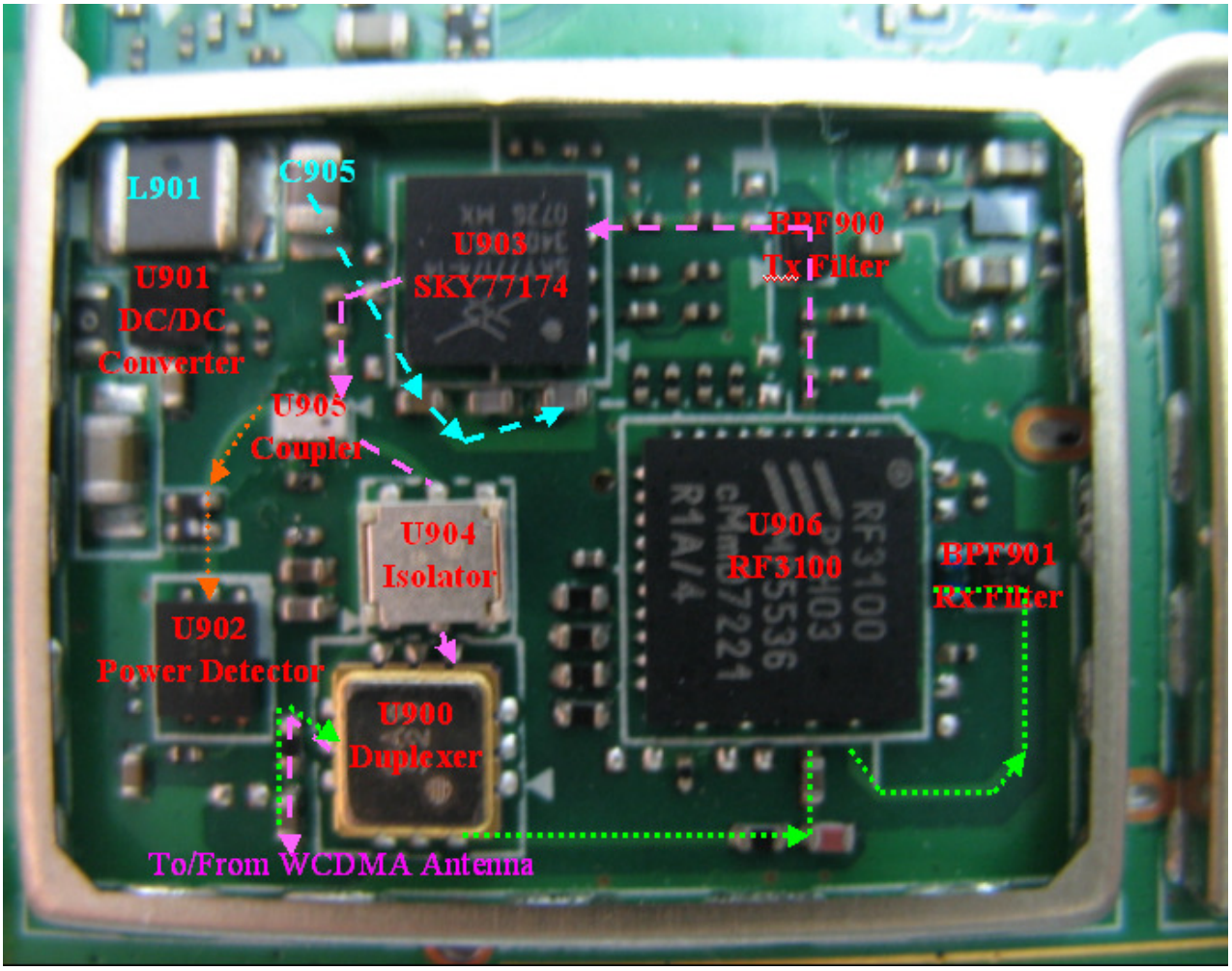


Tx LB Path

Tx HB Path

Rx Path

9.3 WCDMA Tx/Rx Path



Rx Path

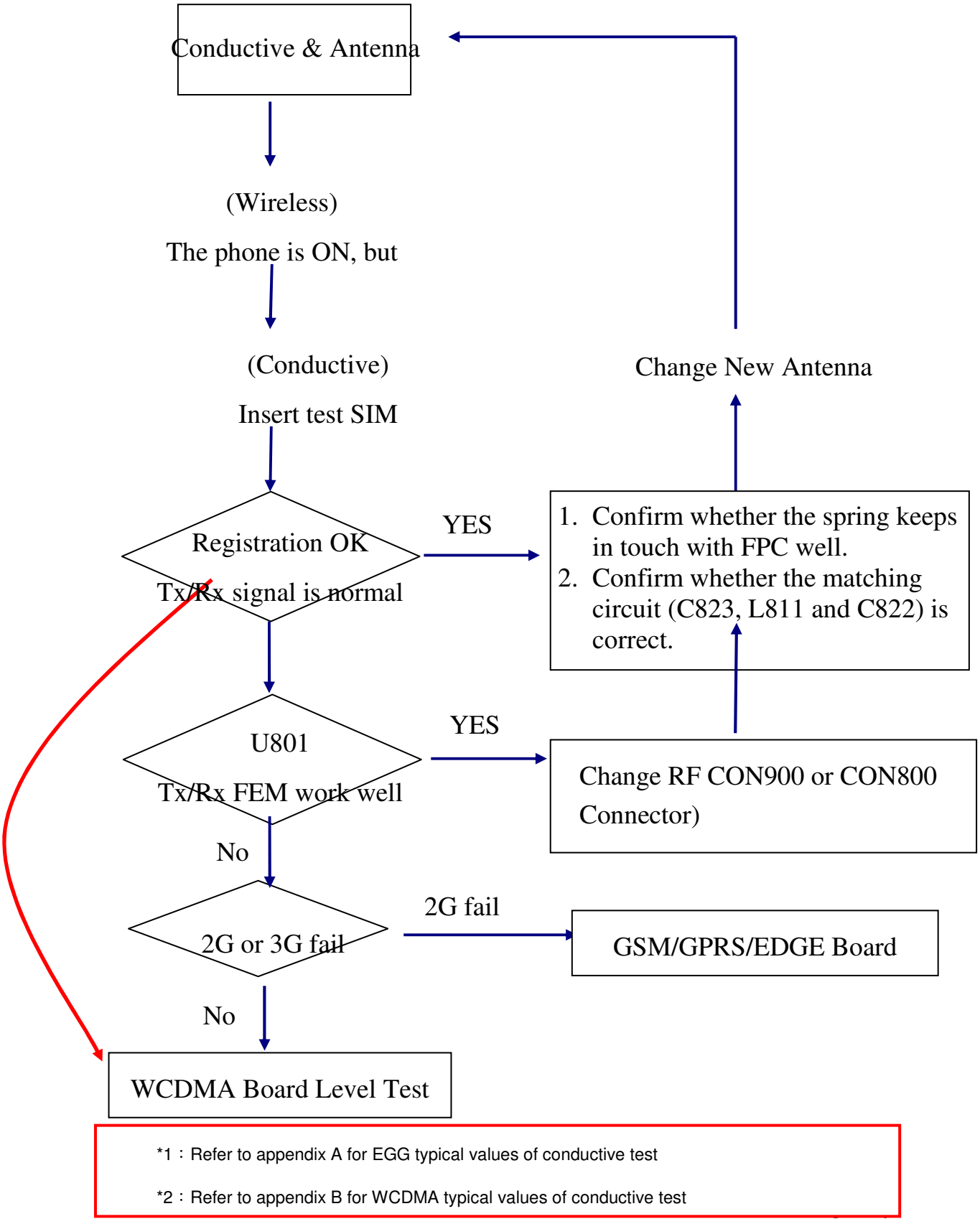
Tx Path

Power Detector Path

PA power supply Path

10. Test & Repair Flow Chart

10.1 Conductive & Antenna Test Procedure



10.2 GSM/GPRS/EDGE Test & Repair Procedure

How RF signal is transmitted and received between components on M930 PCB will be explained in this section. It is important to realize RF transmission path (Tx) and receiving path (Rx) before starting out to repair NG PCB, because engineers need to choose proper test points which assist us to catch the signal quickly

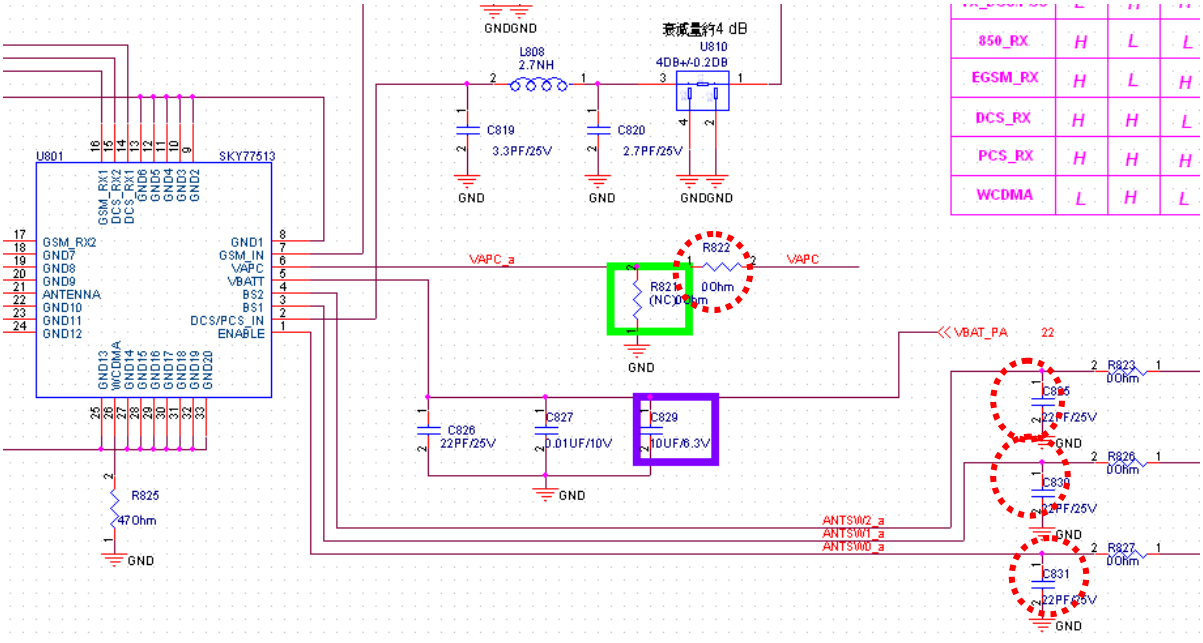
Before beginning to repair, because we have no way of knowing questions. So in the beginning, I will refer the normal RF performance characteristics. According to these descriptions, we can sort out various problems directly.

In GSM part, including several important components mainly, for instance: Front End Module (SKY77513), GSM 4-band transceiver RF3000, Rx filter, and 26MHz Crystal etc. First of all, I will explain the working state of a normal FEM including its test points. You can analysis it according to the result.

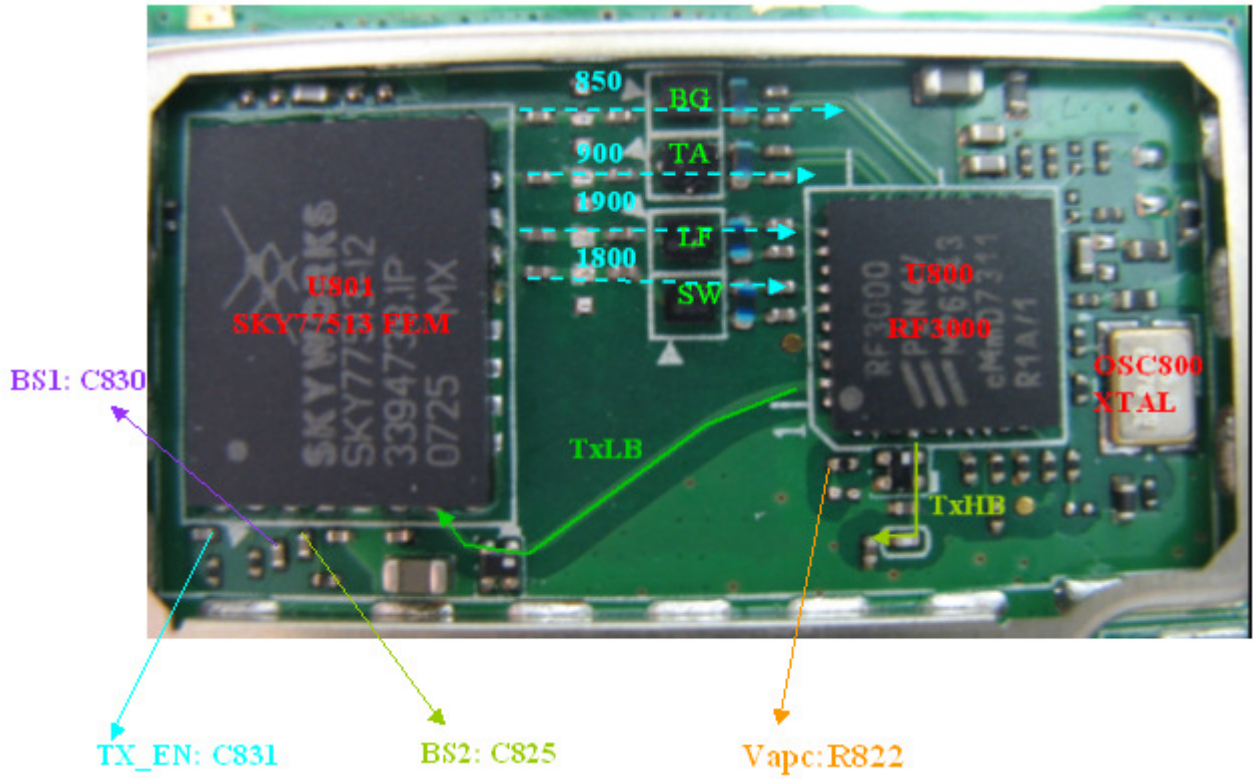
When a phone is connected with the Agilent 8960 tester, There have 3 modes during the normal working state (Fig1)：R (Receiver), T (Transmission), M (Monitor). According to truth table of the circuit diagram, we can judge whether this FEM operates normally or not.

In GSM900 TX mode (Power Level 5) as an example：

1.Check these four components on below diagram (BS1：C830, BS2：C825, TX_EN：C831, and Vapc：R822)

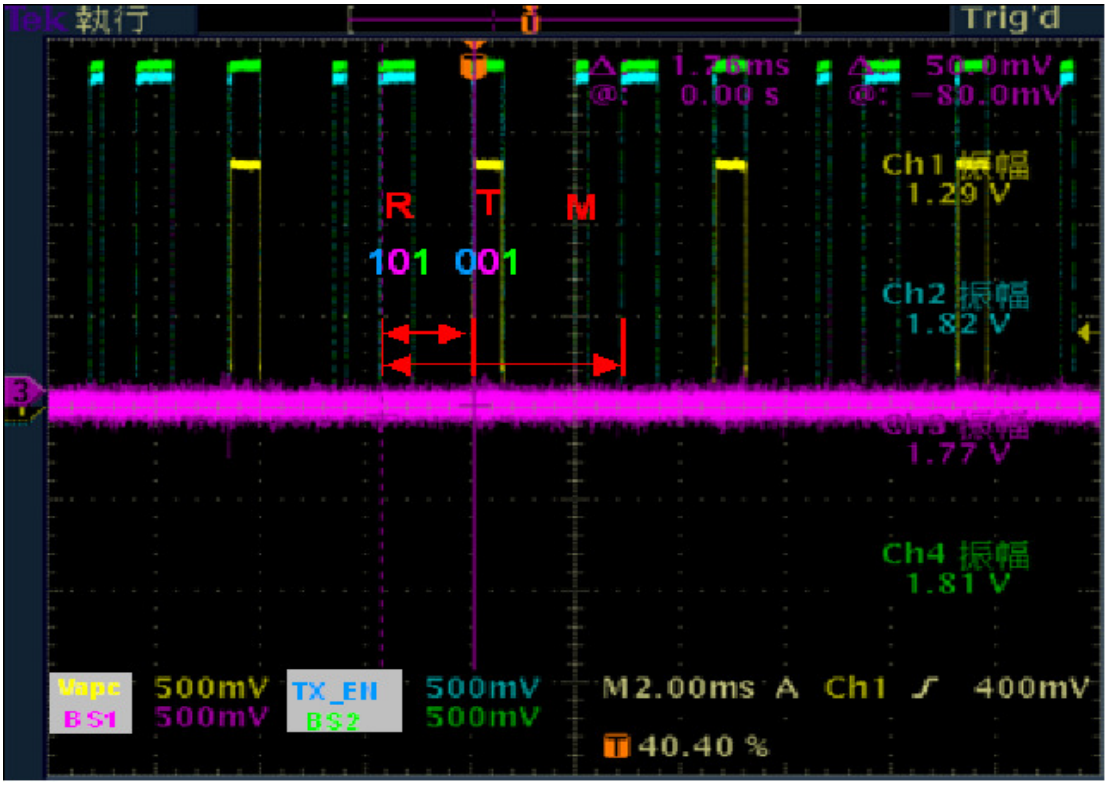


2. Placement on the PCB



3. On the oscilloscope screen

(If there is not any wave to appear, please confirm the power supply first)



4. Truth table of the circuit diagram (‘1’ is 1.8V & ‘0’ is near 0.2V)

Mode	Input Control Bits		
	TX_EN	BS1	BS2
Standby	0	0	0
TX_850/EGSM	0	0	1
TX_DCS/PCS	0	1	1
850_RX	1	0	0
EGSM_RX	1	0	1
DCS_RX	1	1	0
PCS_RX	1	1	1
WCDMA_1	0	1	0

Transmission

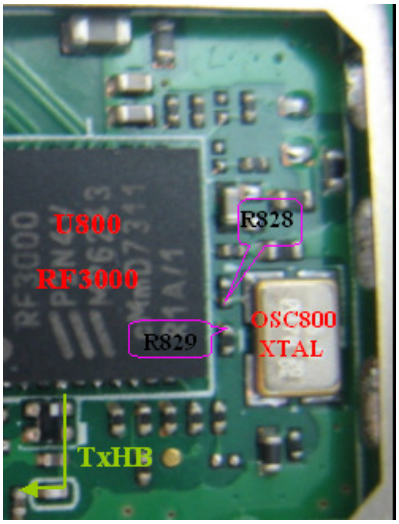
Receiver & Monitor

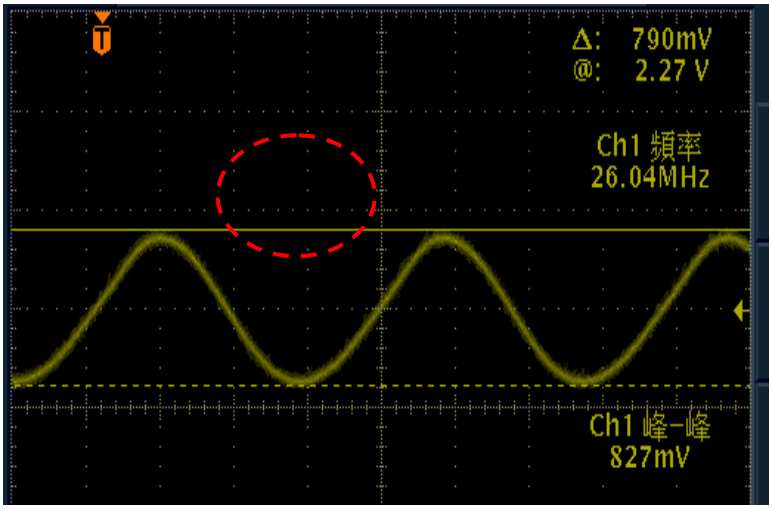
Vapc only exists during that time transmitting (the value can’t over 1.5V).

5. Finally, according to its state form, which kind of wrong we can judge first.

6. 26MHz Crystal

Suppose if there is no signal to appear, first, confirm whether crystal is on normal operation. In addition, because add an electric wire at this moment and influence whole C_L of crystal, the value is not 26MHz definitely, but it’s near.

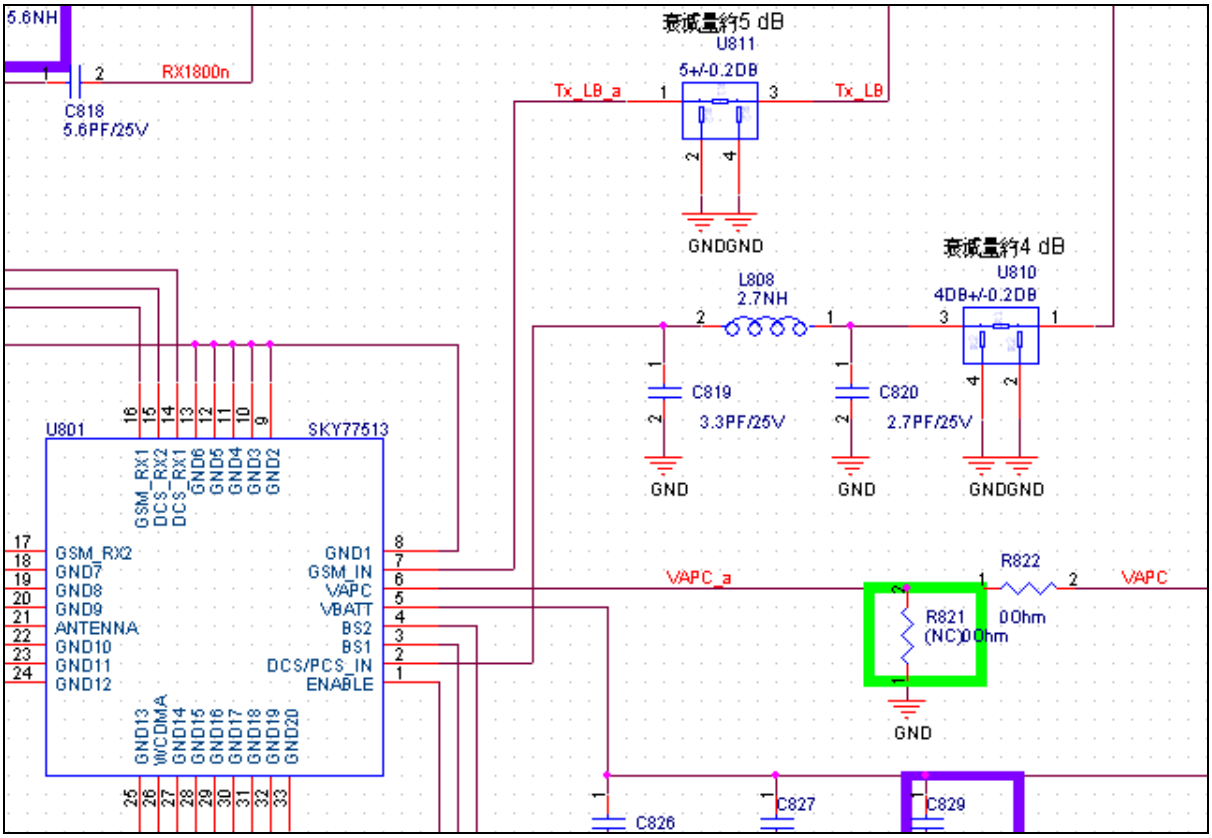




10.3 EGG TX Path

In M930 because PA has already included in SKY77513, there is no component in TX path. Only a low-pass filter exists in high band path. This filter consists of three components ： C819, C820, and L808. In addition, there is an attenuator on each path.

Because it is difficult to obtain high-frequency probe, so I use the probe made by myself (Fig2) to detect power. **Pay attention to this value only for confirming whether the component is normal, does not represent real power value.**



10.3.1 Probe

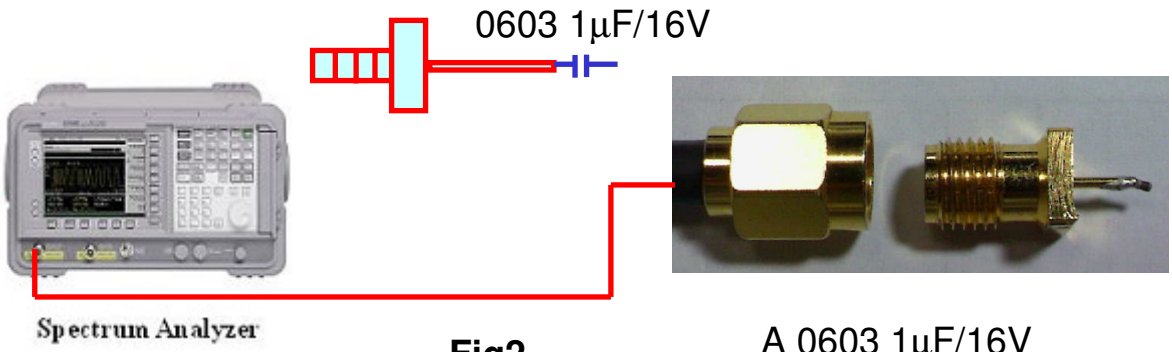
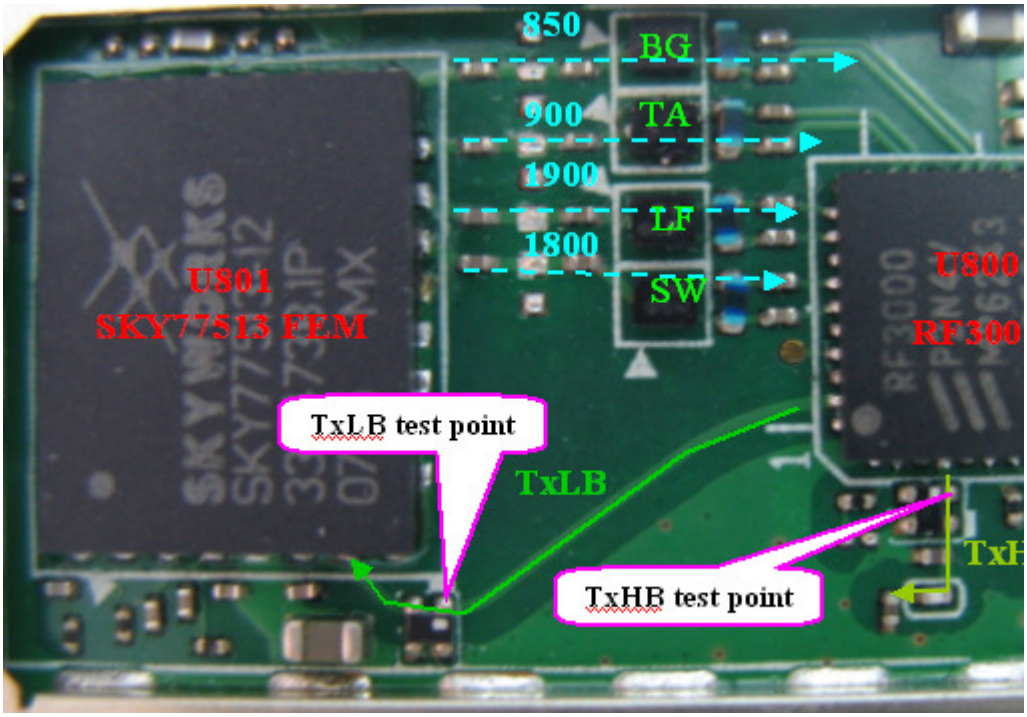


Fig2

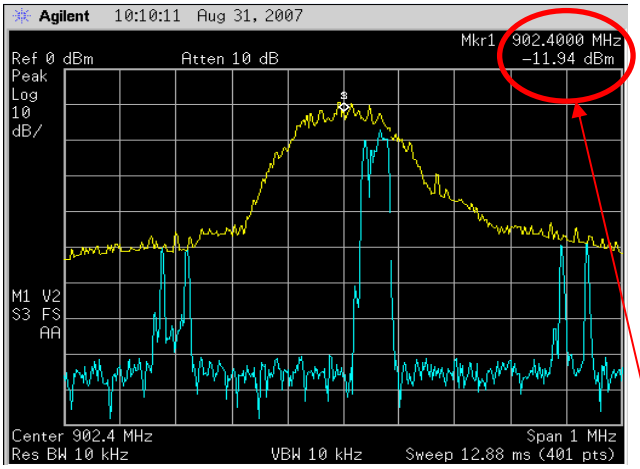
A 0603 1µF/16V Capacitor

10.3.2 Placement on the PCB

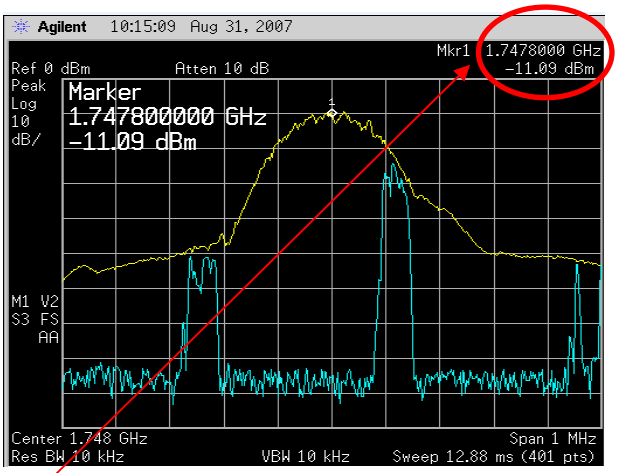


10.3.3 Measurement Result

EGSM900 Ch62



DCS1800 Ch700



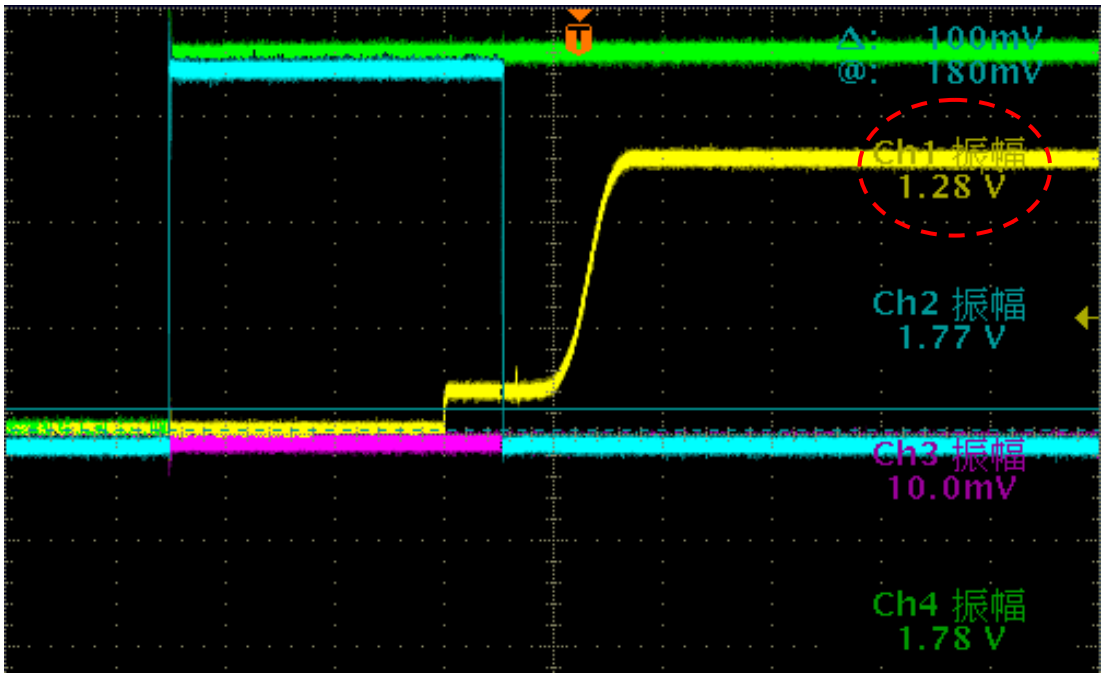
Pay attention to this value only for confirming whether the component is normal, does not represent real power value.

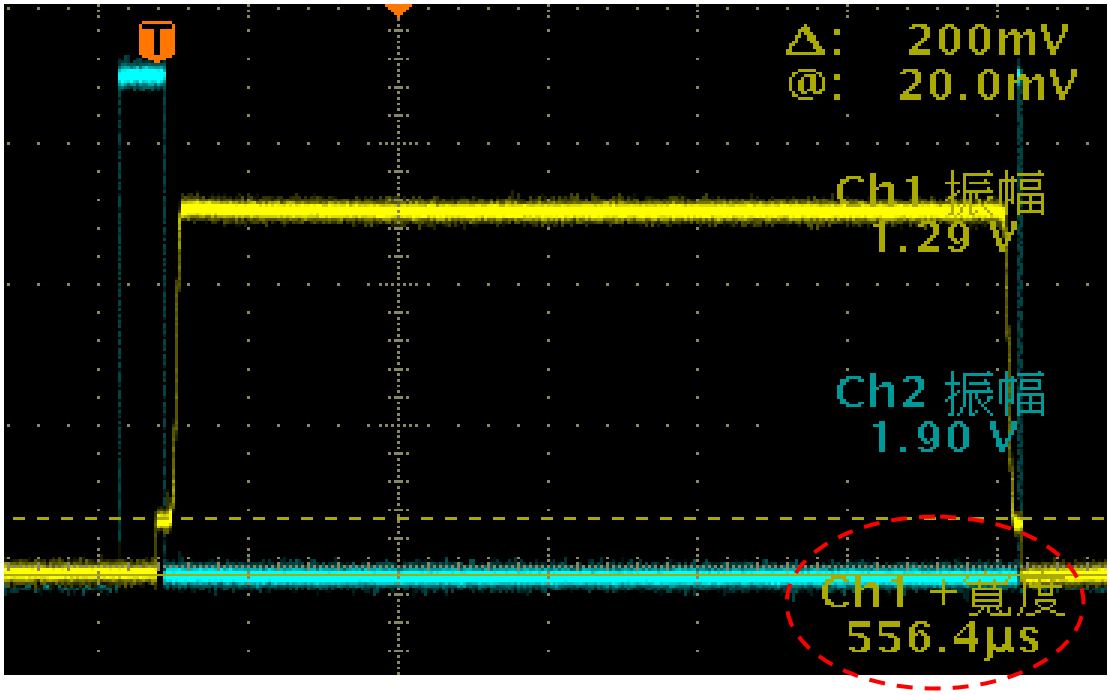
From reading the value, we can judge from it whether their wave and relative value are correct or not. In accordance with the specifications of the probe used, the value of measurement is also not the same.

First, waveforms must be a normal bust, and low band should higher than high band about 1dB. This can only be confirmed TR switch is in normal operation, not guarantee PA normal operation in SKY77513.

Need to confirm the value of Vapc, to find that FEM or TR is problematic.

Enlarge the TX of Fig2(振幅：amplitude & 寬度：width)



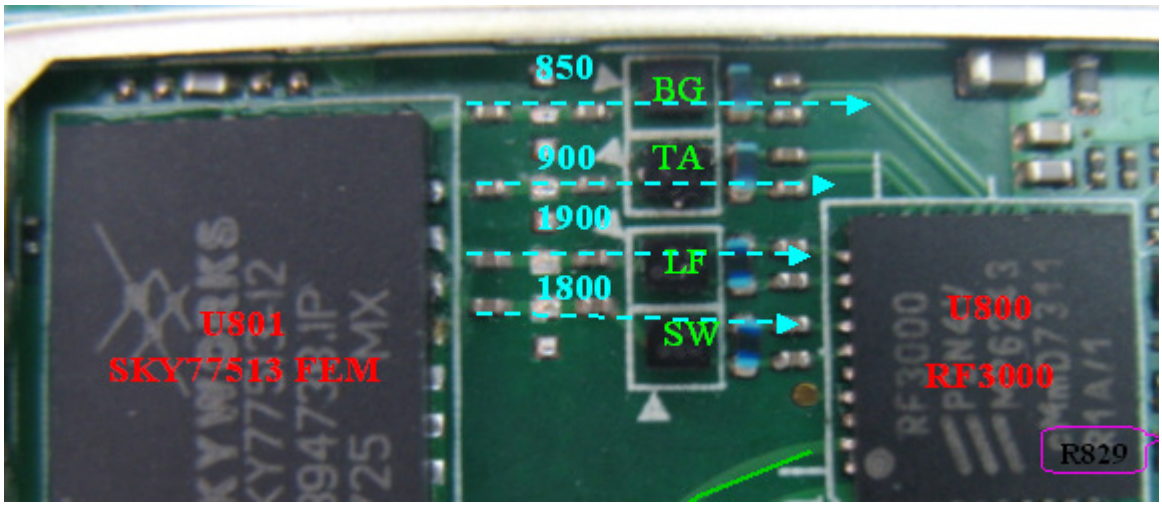


Range of Vapc is as follows：

1. Low band 850/EGSM ：PL5 Vapc=1.29(V) ~ PL19 Vapc=0.27(V)
2. High band 1800/1900 ：PL0 Vapc=1.28(V) ~ PL 15 Vapc=0.26(V)

10.4 EGG RX

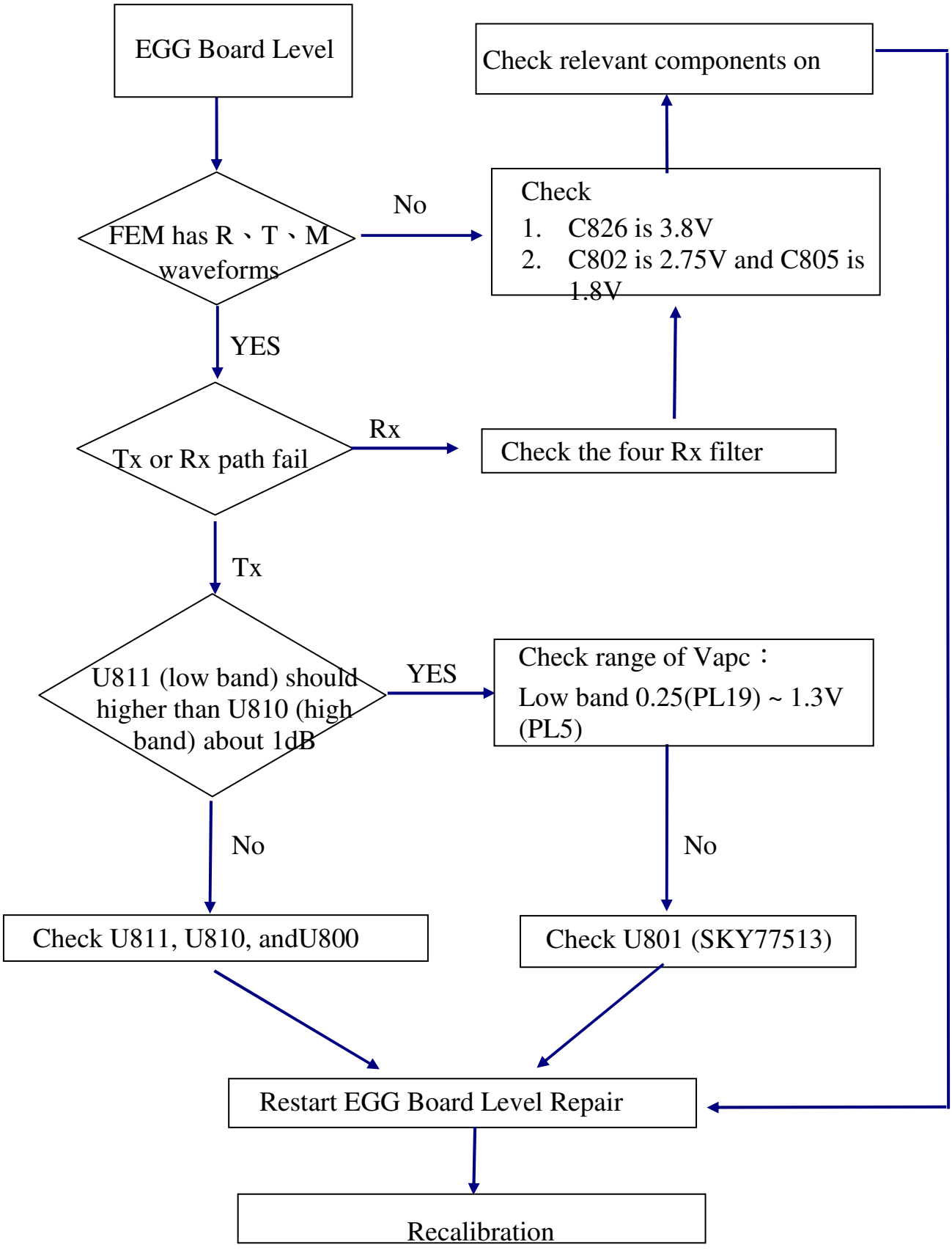
Because there are only four filters on RX path, so when the question happens, confirm the exactness of the packaging on filter at first. Later, according to RX of Fig1, confirmed that operation was normal, and observe the frequency of crystal is working or not.



Rx Filter packaging is as follows：

1. **BG**：850
2. **TA**：900
3. **LF**：1900
4. **SW**：1800

10.5 GSM/GPRS/EDGE Repair Procedure



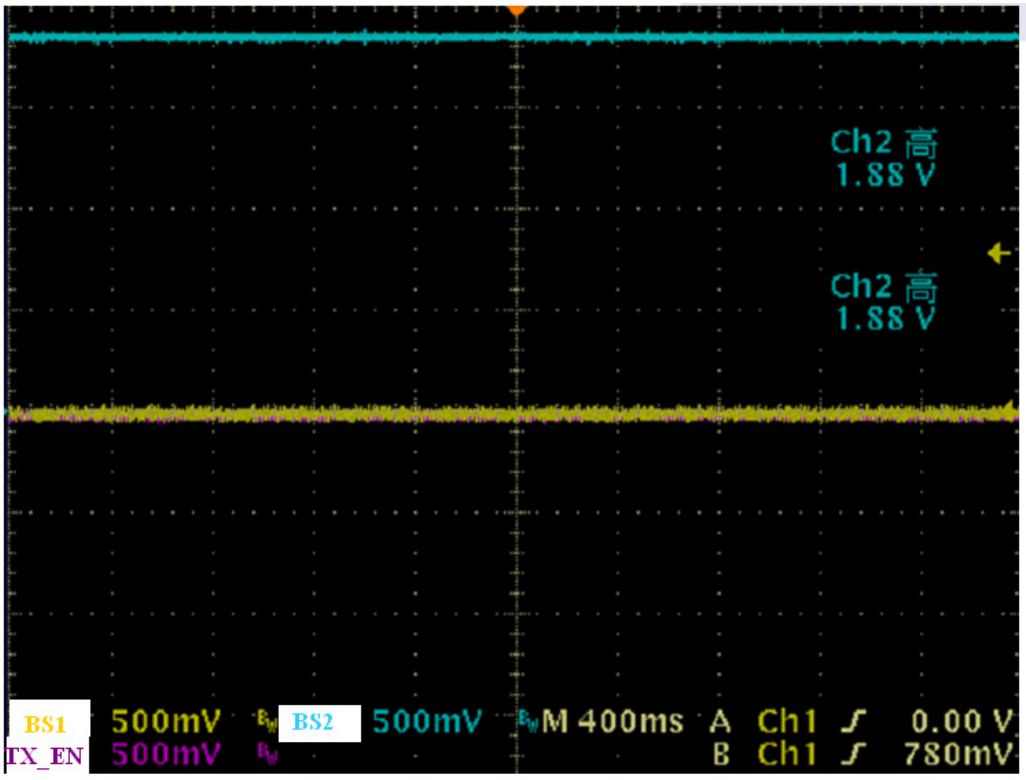
10.6 WCDMA Test & Repair Procedure

WCDMA part in M930i, only support band1, its component is much more than EGG part. The main component is as follows, PA, duplexer, TX filter, RX filter, coupler, isolator, and RF3100 etc. WCDMA uses code to distinguish user, each user uses the same frequency, so especially need to pay attention to the control of power. And then, I will use the same analytical method of EGG.

The same as EGG, we observe the state of FEM first. Because WCDMA does not make FDD, there are no R, T, M phenomenon to take place.

Take WCDMA as an example：

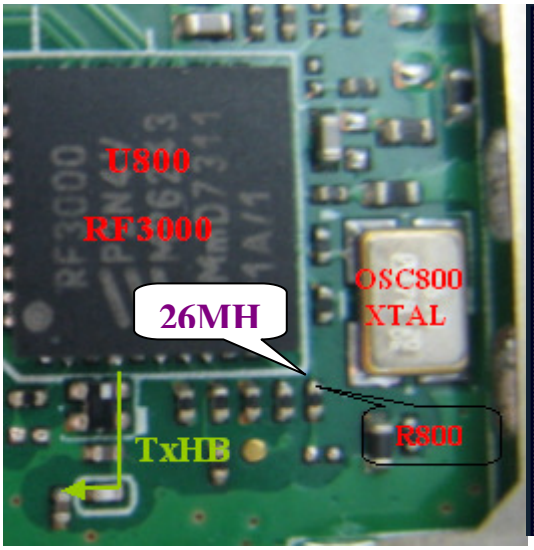
When already connecting to communication tester. No matter TX or RX are the same.

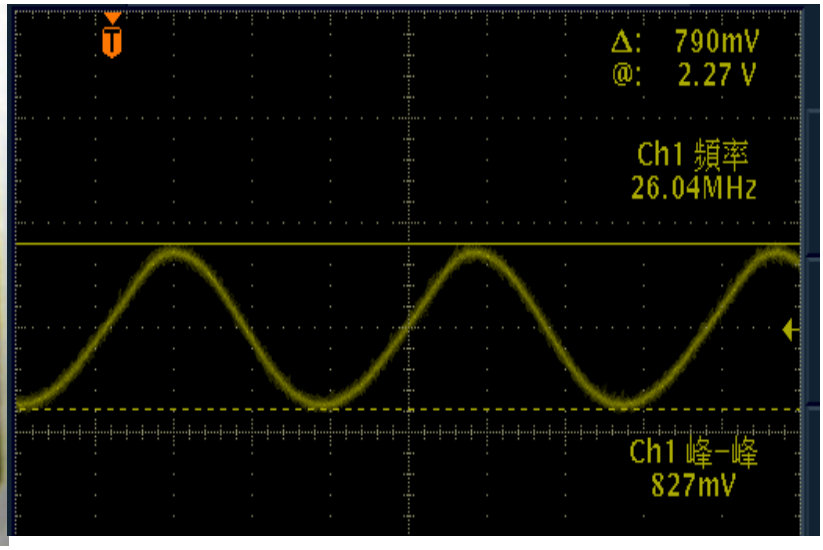


Both of BS1 and TX_EN are low, only BS2 is high (‘1 ’ is 1.8V).

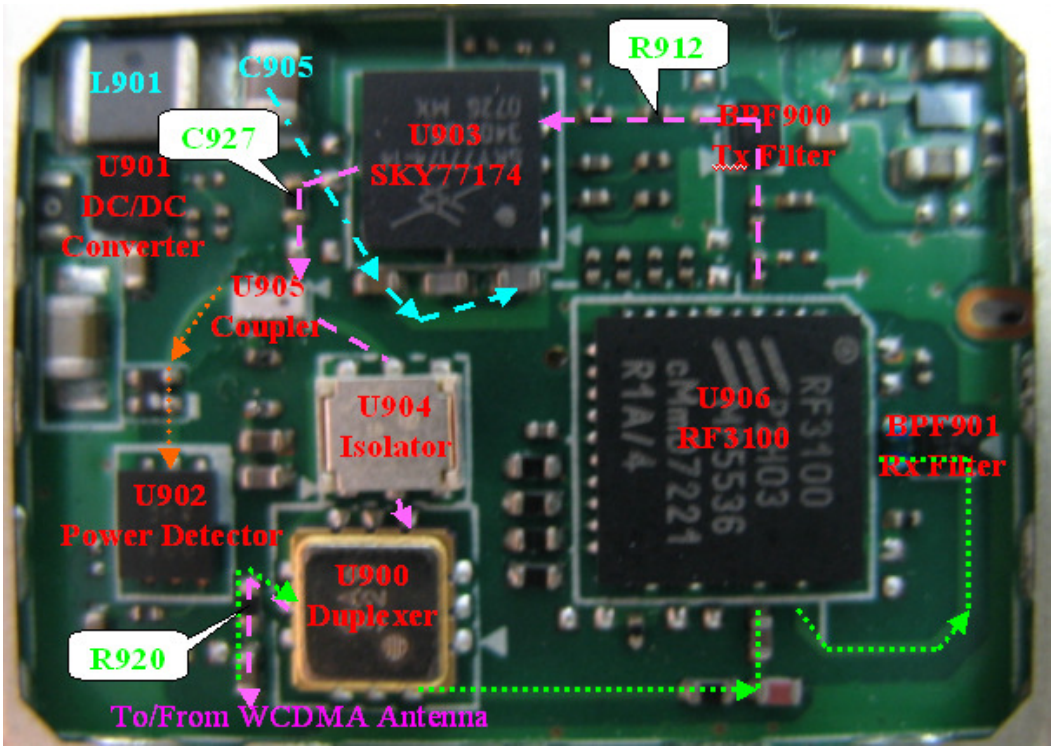
10.7 WCDMA TX

Before repairing, please confirm one thing first. WCDMA RF reference clock (26MHz) is offered by RF3000, so please check R800 to be 26MHz first.

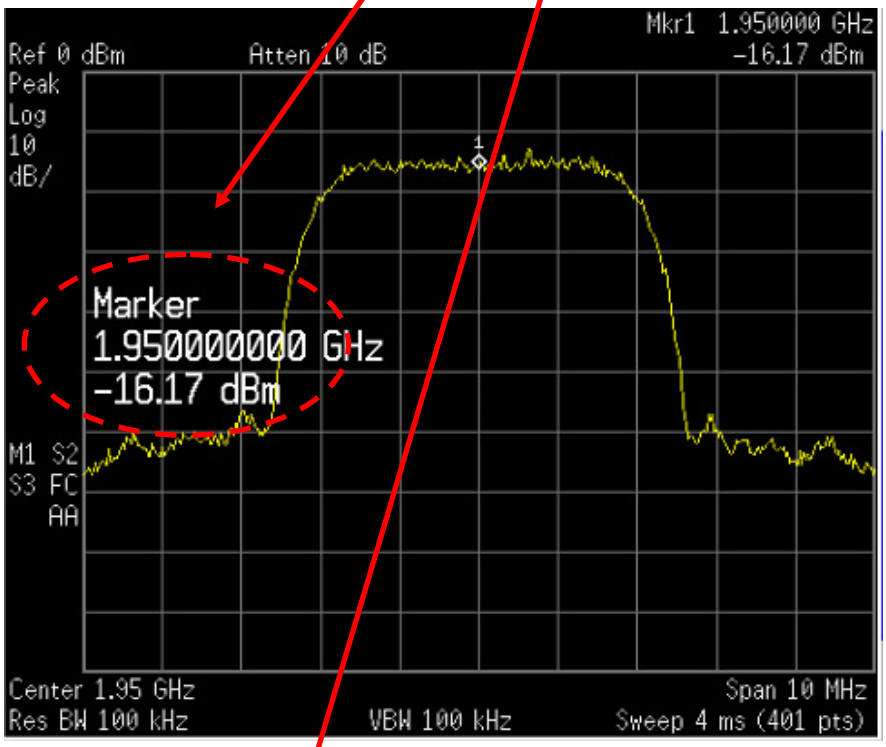




Then, we will analysis the component characteristic on TX path; The signal will include its relative value. First of all, we probe into some characteristics of WCDMA transceiver first. Its power parts are divided into two parts: Analog (check R909 is 2.75V) and Digit (check R919 is 1.8V). In WCDMA TX part, both of I and Q channel are QPSK signal (R921, R923, R925, and R929).

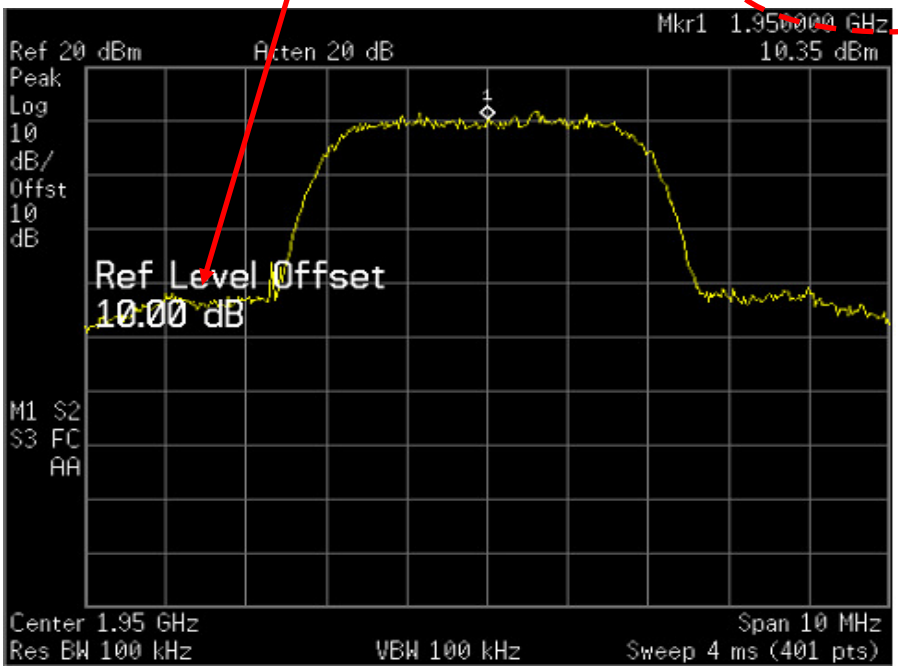


Using probe (Fig2) to check TX SAW Filter output (R912), can see a WCDMA signal. **Pay attention to the value only for confirming whether the component is normal, does not represent real power value.**



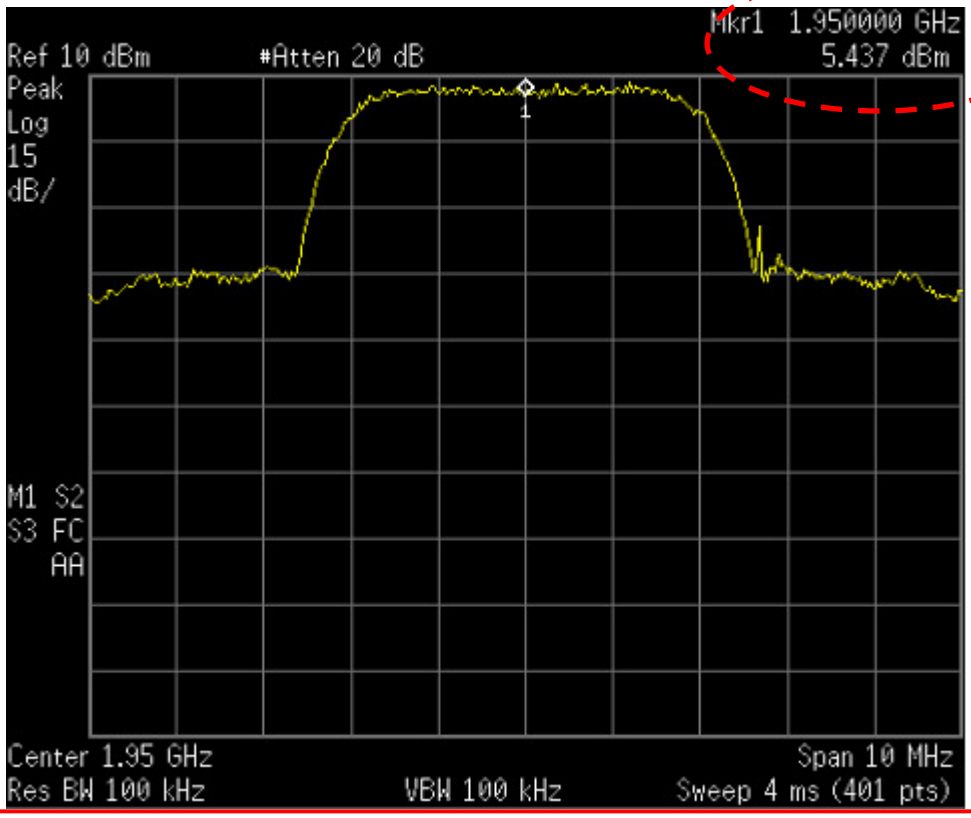
Check PA output (C927(it's a resistor R))

Conductive Power is 23dBm (CON900)



PA Gain Condition： In high power mode is more than 27dB.

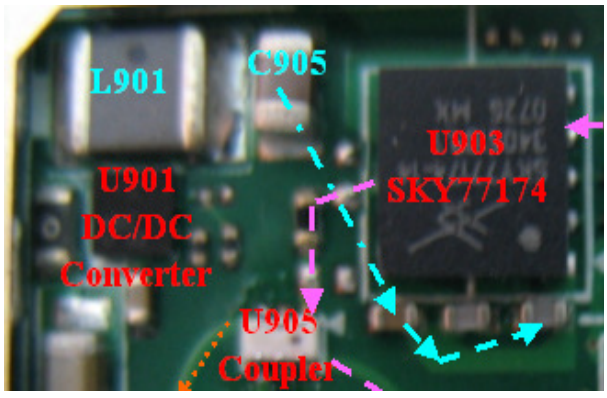
Check Duplexer output (R920)

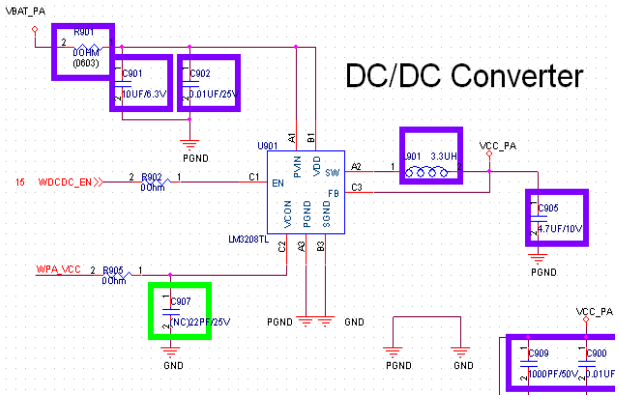


Pay attention to this value only for confirming whether the component is normal, does not represent real power value.

In TX part, the main components are all passive, except PA and RF3100. So must especially discuss the operation principle of PA finally. This is divided into two parts：One is power supplied and the other is power detector.

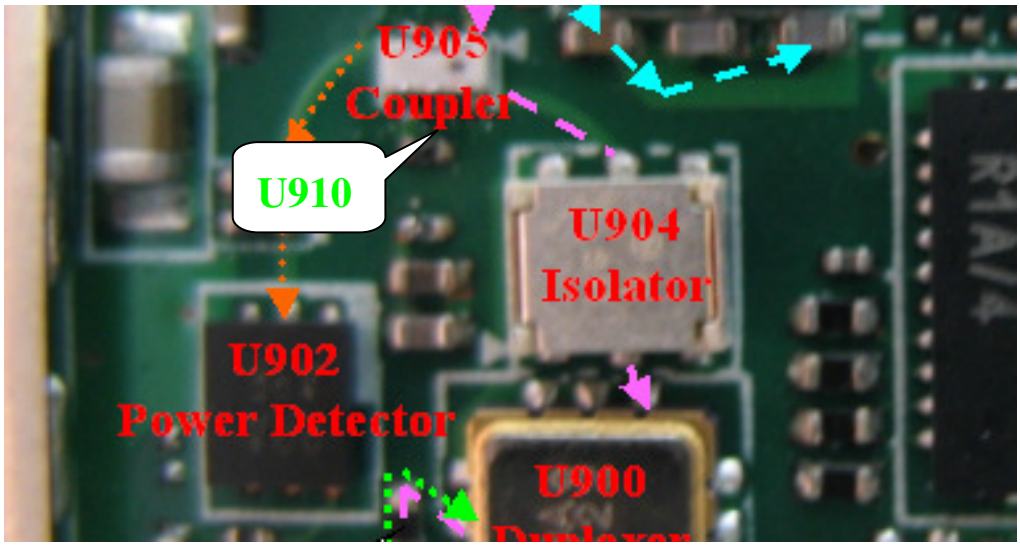
DC/DC converter is used to reduce WCDMA power consumption. VCC _ PA is divided into two pieces of power：One is VCC1 (3.15V) for driving amplifier and the other is VCC2 (3.15V) for power amplifier.

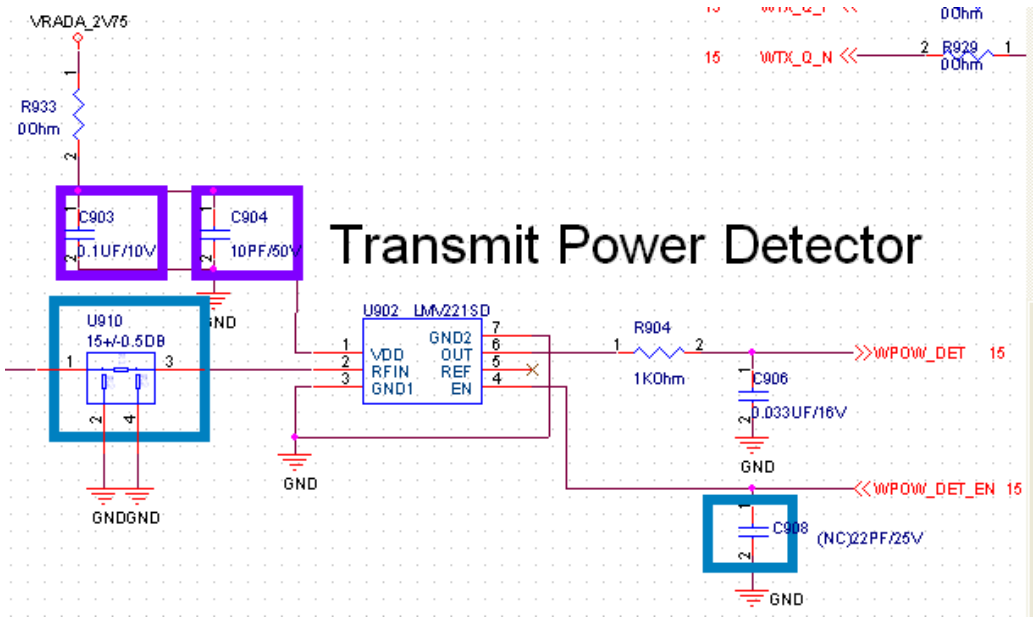




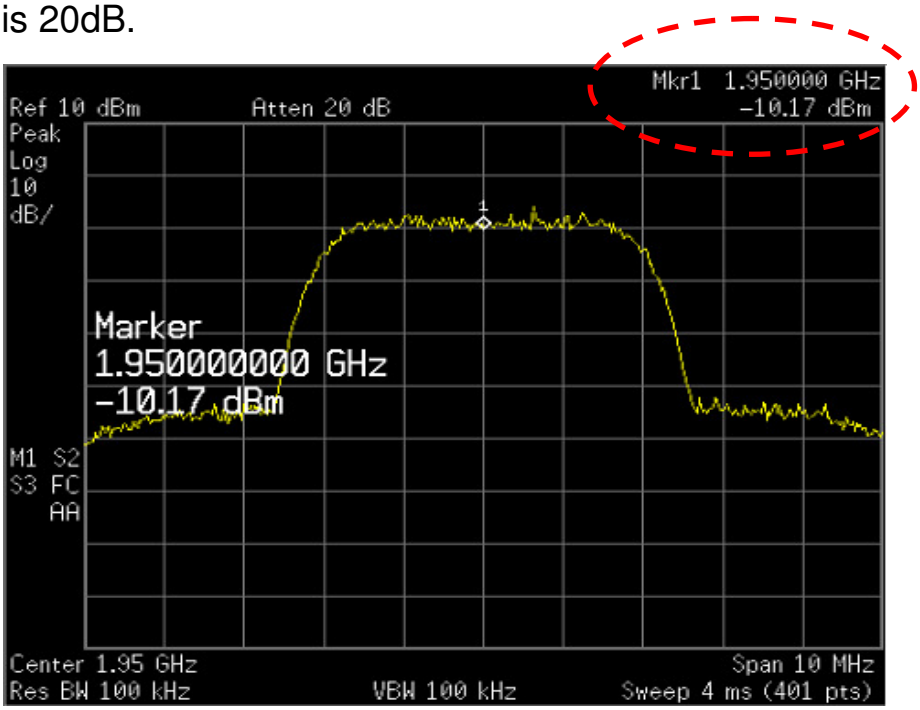
RF3100 has two RF _ DAC must be paid attention to：RF_DAC1 and RF_DAC2. DAC1 gives PA, and DAC2 gives DC/DC converter. In 23dBm, both of DAC1 (R910) and DAC2 (R905) are all 1.27 V；In 11dBm, DAC1 is 670mV and DAC2 is 570mV.

Power detector is used to feedback power to DB3150, to transmitter correct wanted power.

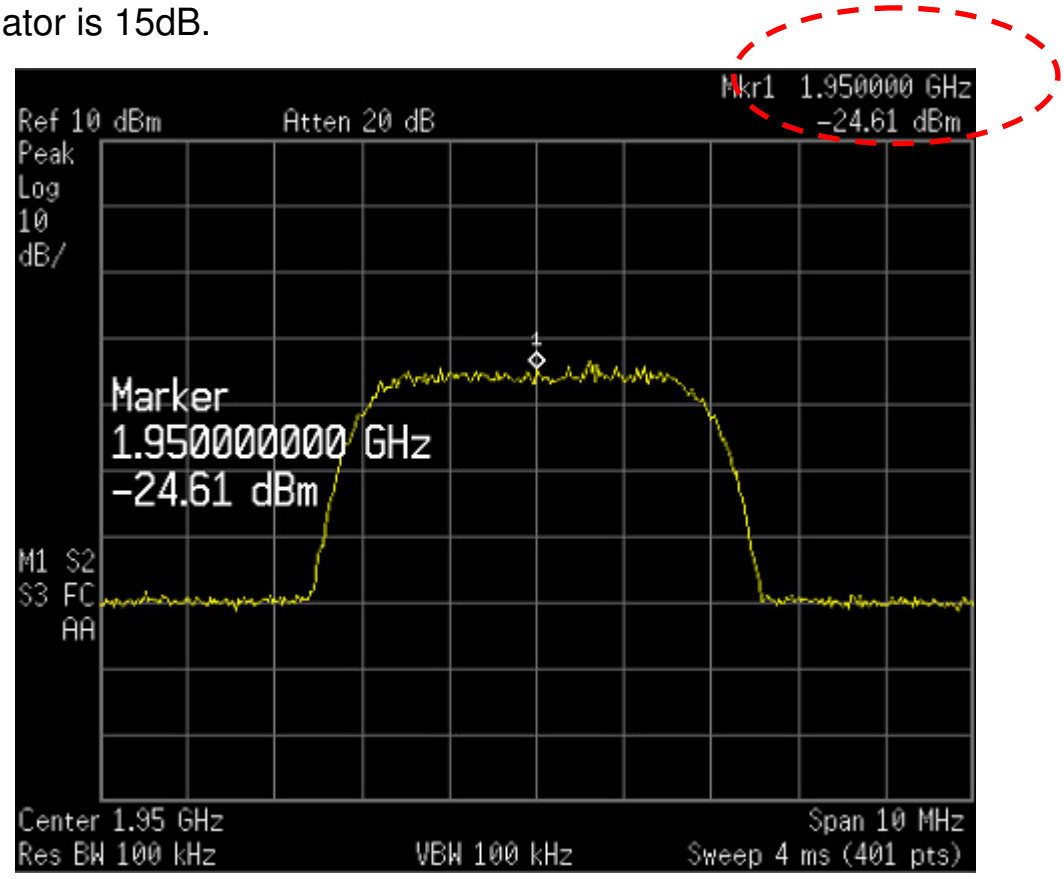




Check WPOW_SENSE (U910 input) = PA output power - 20dBm ： Coupling is 20dB.



Check power detector output (R904) = WPOW_SENSE – 15dBm ： Attenuator is 15dB.

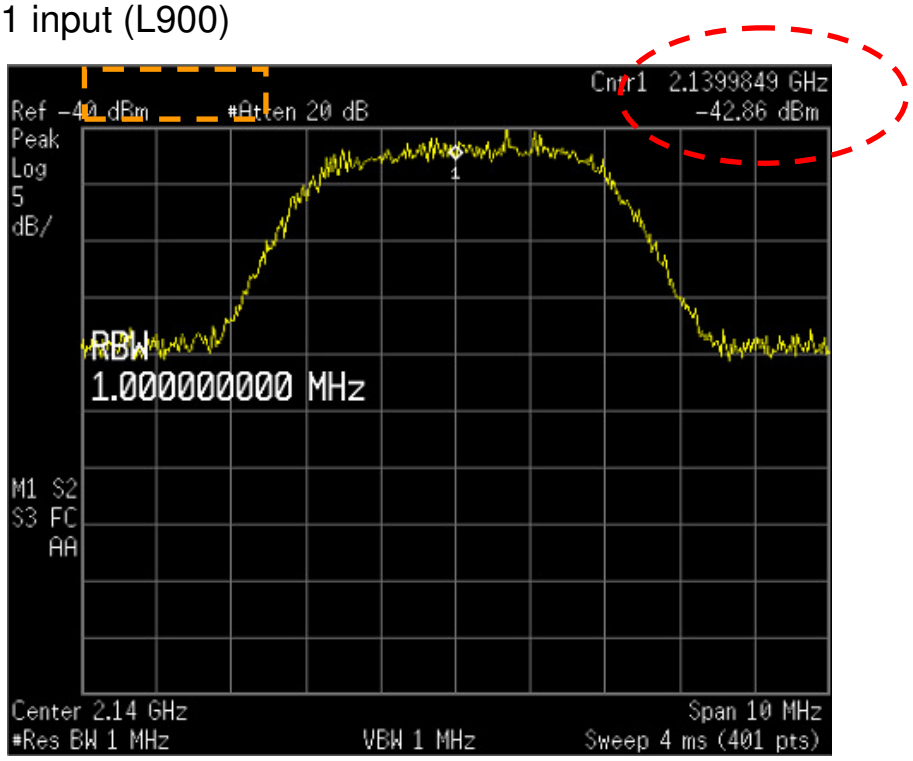


10.8 WCDMA RX

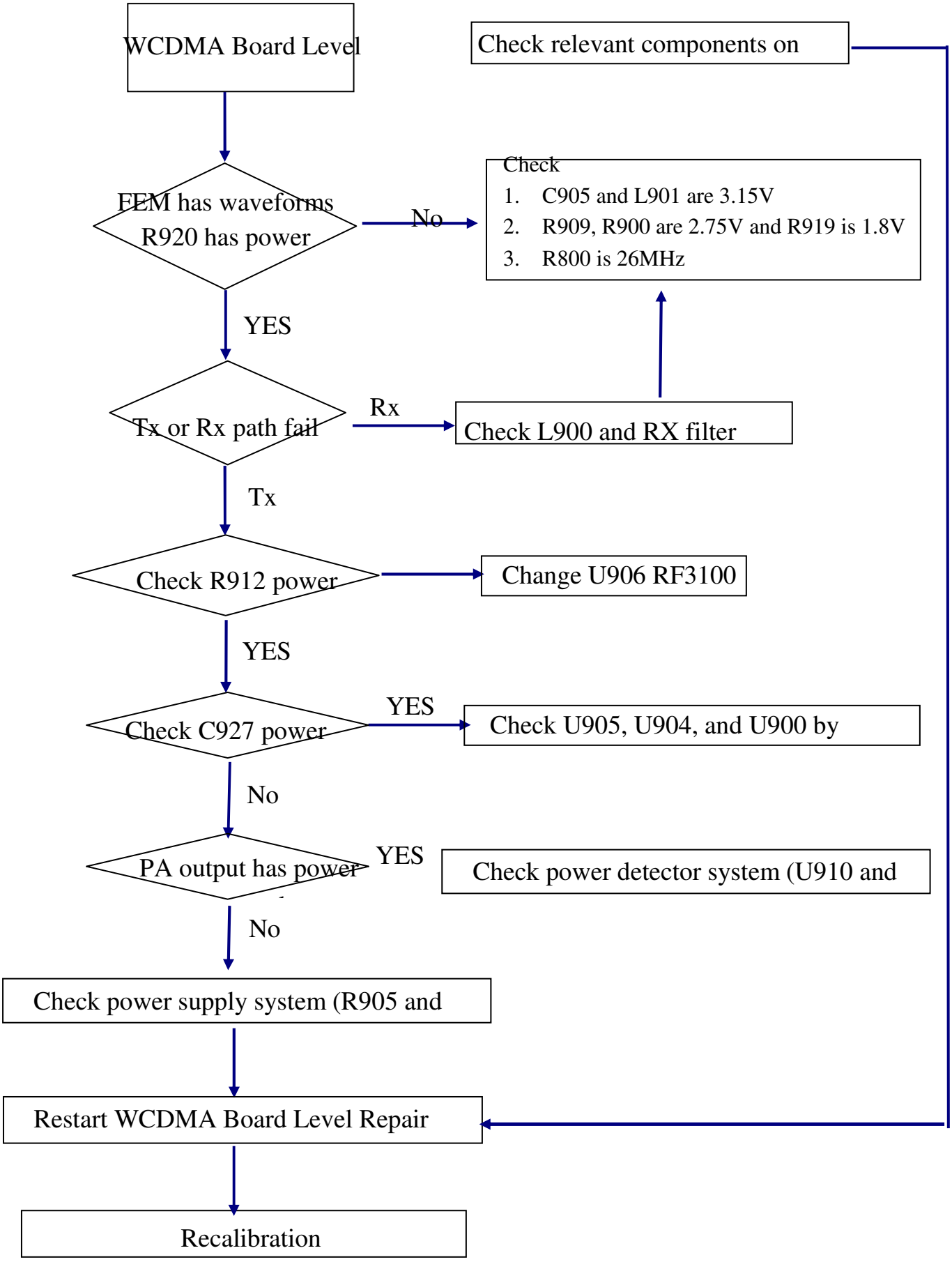
Finally, we will analysis the RX characteristic. In WCDMA RX part, both of I and Q channel are HPSK signal (R924, R926, R930, and R931). On RX path, only one RX filter is external. It has a LNA (16dB) within RF3100 that amplifies the RX signal.

Because the strength of RX signal is too small, so spectrum must have **some extra setup**. In order to observe the signal easily, must strengthen BCH to - 30dBm.

Check MIX1 input (L900)



10.9 WCDMA Test & Repair Procedure



Appendix

Appendix A

GSM850			EGSM			DCS			PCS		
128	5	32.35133	975	5	32.38822	512	0	28.82638	512	0	29.17835
128	6	30.24166	975	6	30.3814	512	1	27.57655	512	1	27.92274
128	7	28.71602	975	7	28.75588	512	2	25.64798	512	2	26.15754
128	8	27.03026	975	8	27.18105	512	3	23.6323	512	3	23.98335
128	9	24.72627	975	9	24.95112	512	4	21.63441	512	4	22.05043
128	10	22.90019	975	10	22.91327	512	5	19.82703	512	5	20.05965
128	11	20.9212	975	11	21.0084	512	6	17.85999	512	6	18.04764
128	12	18.71972	975	12	18.89693	512	7	15.6064	512	7	15.95084
128	13	16.73789	975	13	16.86268	512	8	13.56003	512	8	13.86856
128	14	14.86203	975	14	14.96216	512	9	11.79106	512	9	12.1089
128	15	12.97723	975	15	13.1355	512	10	9.888189	512	10	10.16195
128	16	10.47211	975	16	10.82482	512	11	7.599005	512	11	7.863603
128	17	8.907961	975	17	9.11896	512	12	5.472065	512	12	5.763629
128	18	6.753347	975	18	7.1998	512	13	3.540835	512	13	3.777081
128	19	4.445558	975	19	5.176389	512	14	1.469907	512	14	1.738323
						512	15	-0.74076	512	15	-0.52569

Appendix B

Band	WCDMA		
ARFCN	9612	9750	9888
Conductive Power(dBm)	23.5	23.5	23.5

Appendix C

1. Introduction

This document describes the operating method by using E-Tool for EMP U360.

2. Set Slot ID

Step 1

The **E-Tool V1.0** dialog box will show when you execute **P_E_tool.exe**.

Step 2

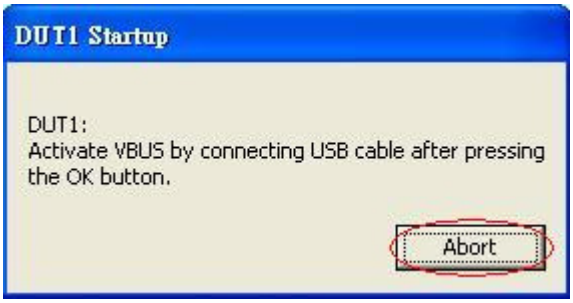
Choose **Function->Slot ID**, and click it to Set Slot ID automatically.

Step 3

It will show the following dialog , click “確定” to continue.

Step 4

It will show the following dialog, turn on inactive DUT, to click “Abort” to continue.



Step 5

If it shows the following dialog , click“確定” and please repeat Step2 through to Step4 .

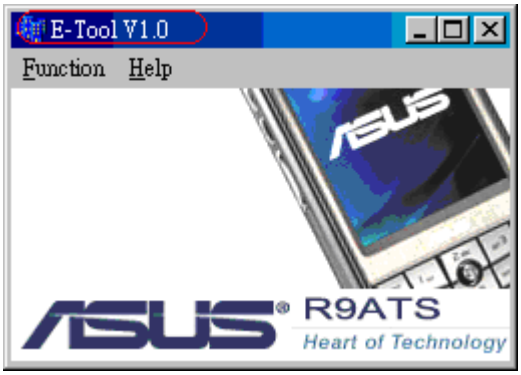
Step 6

If the following dialog appeared, it represents Set Slot ID successfully.

3. Switch to TP Mode

Step 1

The **E-Tool V1.0** dialog box will show when you execute **P_E_tool.exe**.

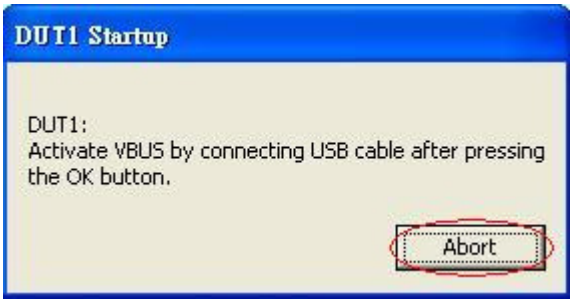


Step 2

Choose **Function->TP Mode**, and click it to make the DUT switch into TP mode.

Step 3

It will show the following dialog, turn on inactive DUT, to click “Abort” to continue.

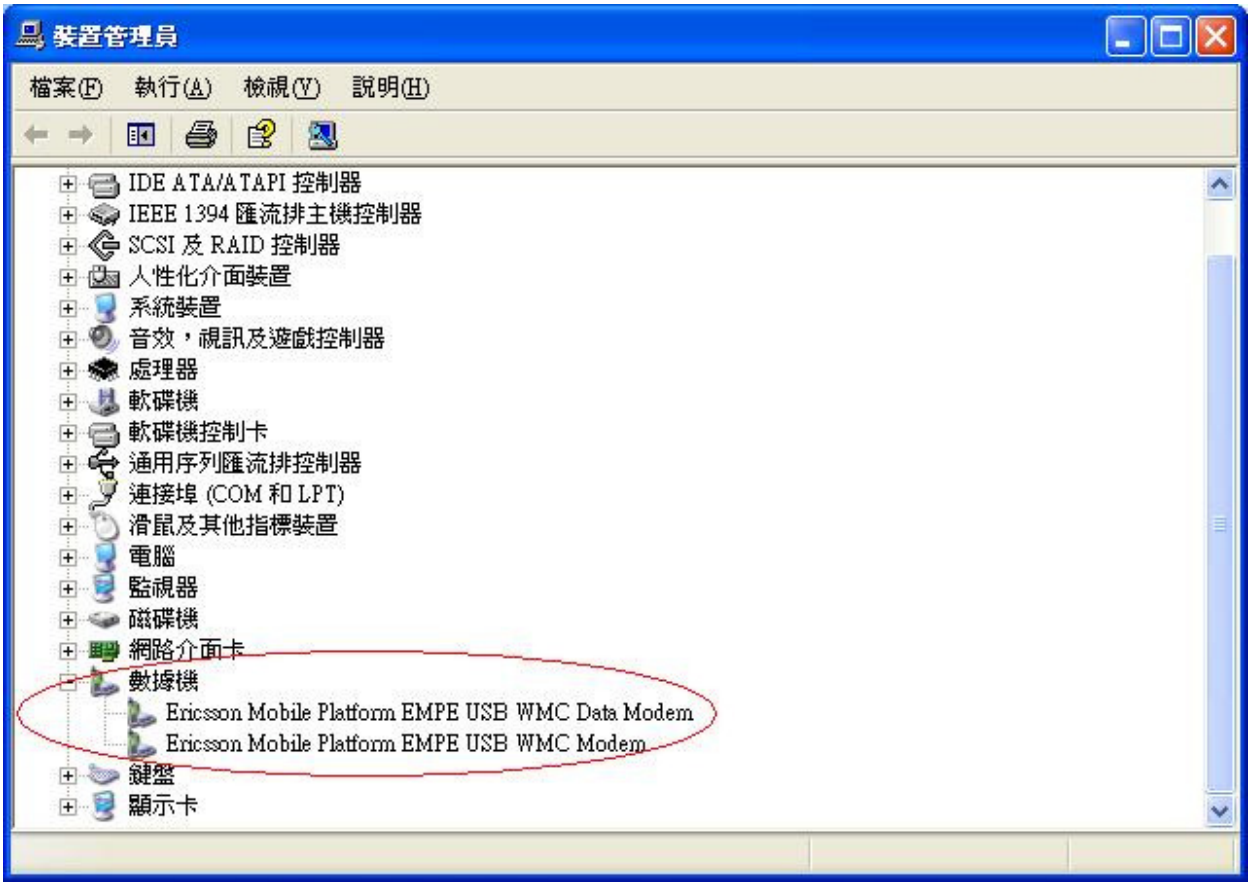


Step 4

If it shows the following dialog , click“確定” and please repeat Step2 through to Step3.

Step 4

If the following dialog appeared, it represents DUT switched into TP mode successfully.



4. Operating Method

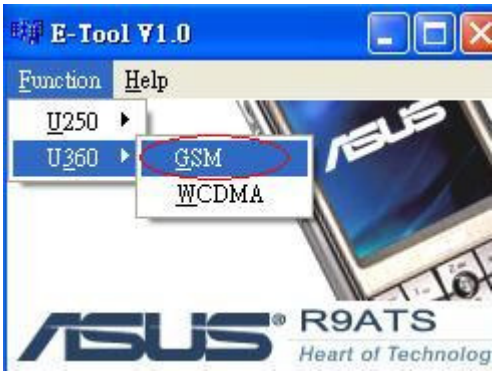
GSM PART

Step 1

The **E-Tool V1.0** dialog box will show when you execute **P_E_tool.exe**.

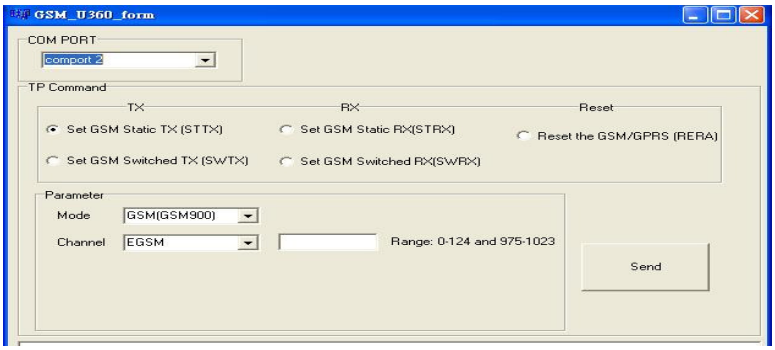
Step 2

Choose **Function->U360->GSM**, and click GSM to show **GSM_U360_form** dialog box.



Step 3

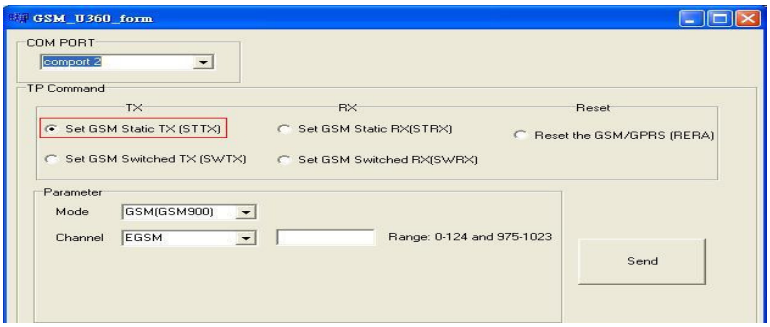
Choice comport number to communicate with M930 (seen by computer).



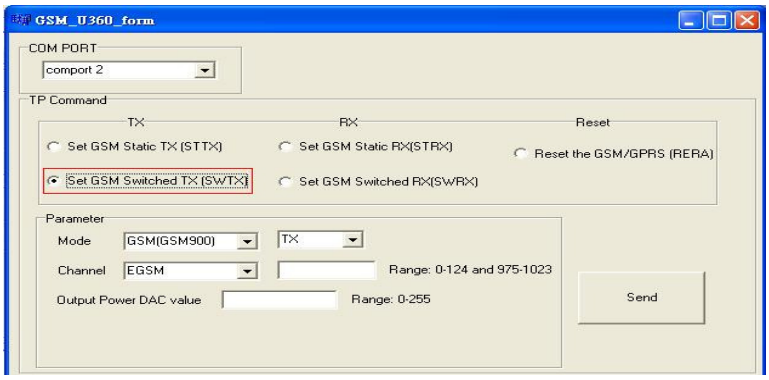
Step 4

Chose which TP command to send

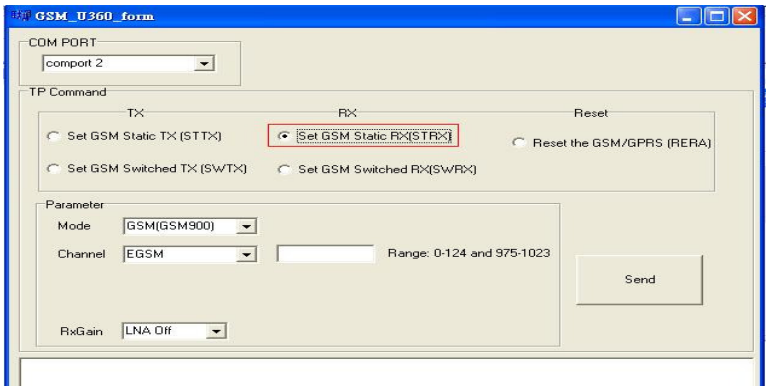
Set GSM Static TX



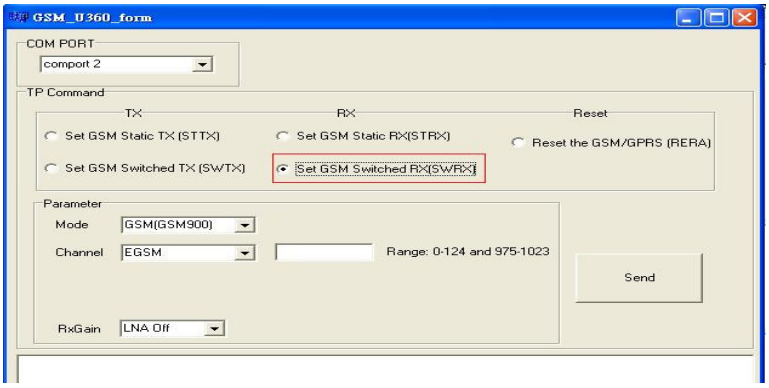
Set GSM Switched TX



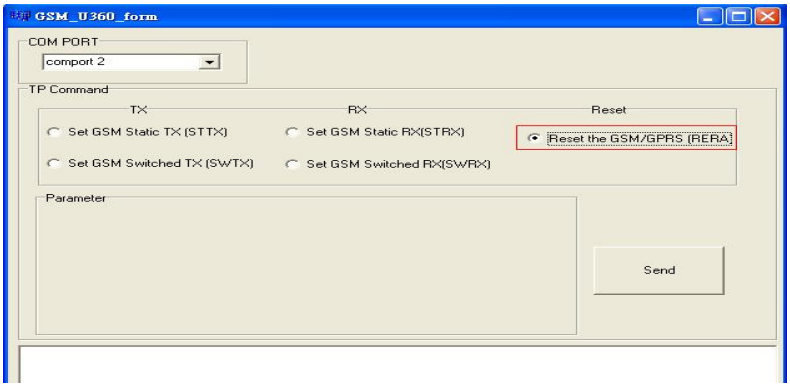
Set GSM Static RX



Set GSM Switched RX



Reset the GSM Radio



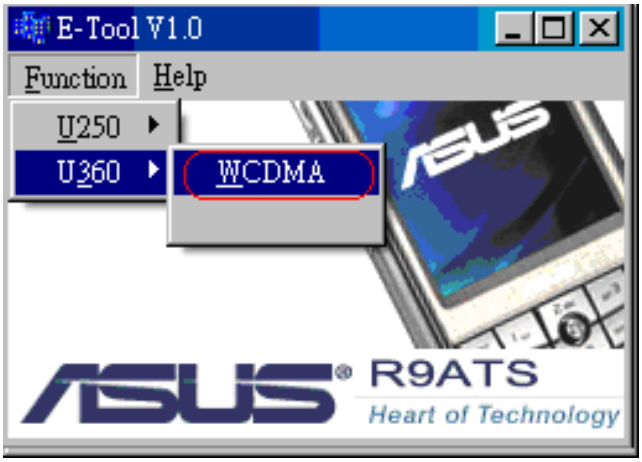
WCDMA PART

Step 1

The **E-Tool V1.0** dialog box will show when you execute **P_E_tool.exe**.

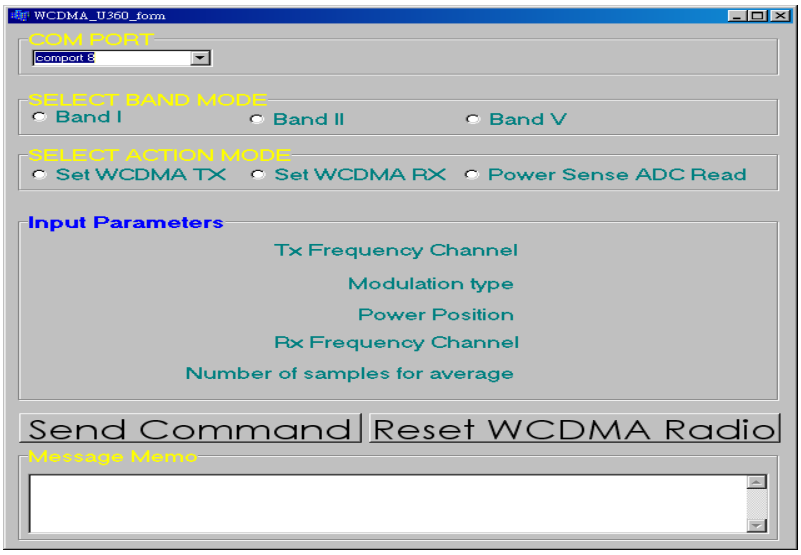
Step 2

Choose **Finction->U360->WCDMA**, and click WCDMA to show **WCDMA_U360_form** dialog box.



Step 3

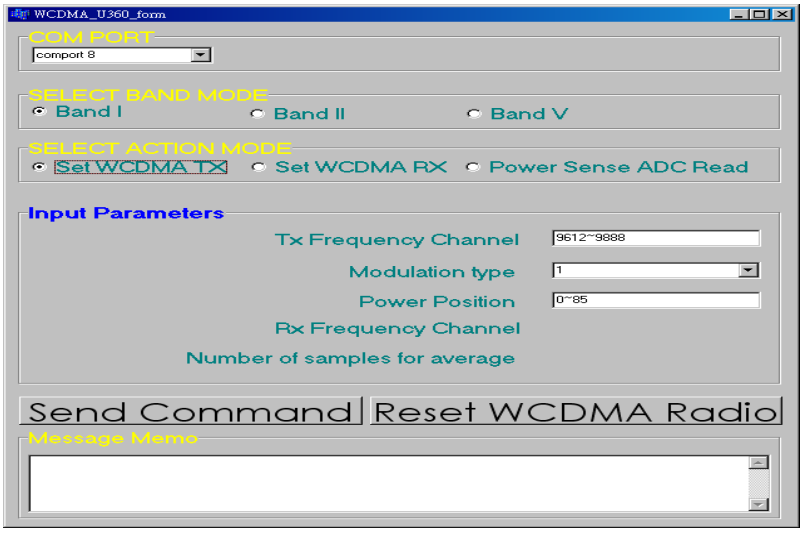
Choice comport umber to communicate with M930.



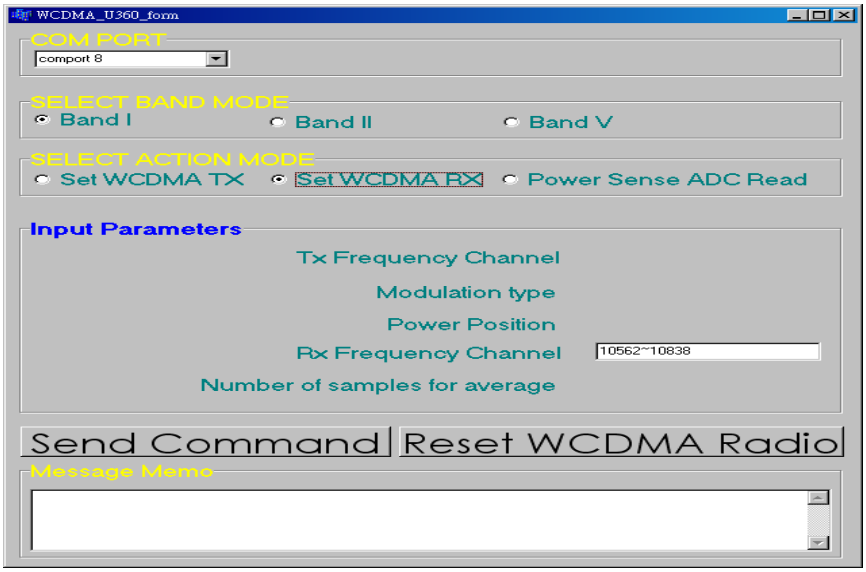
Step 4

Choice Band MODE to send the TP command

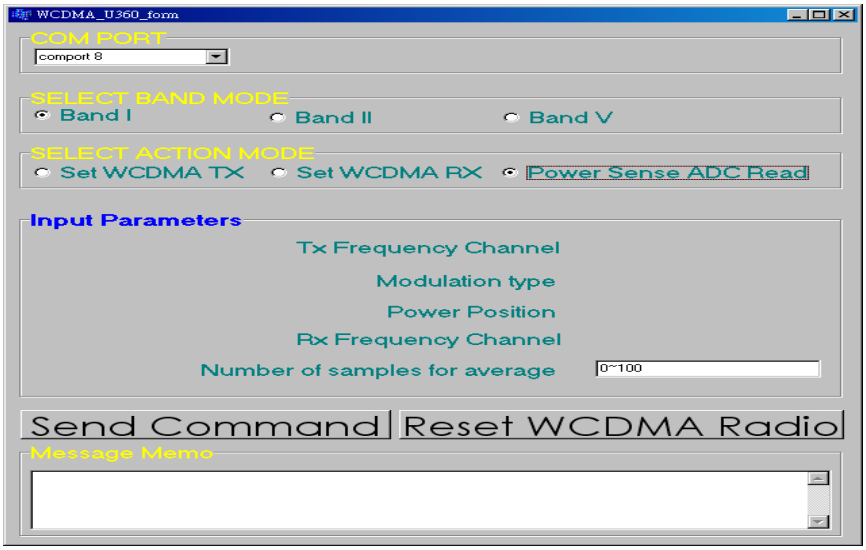
Set WCDMA TX



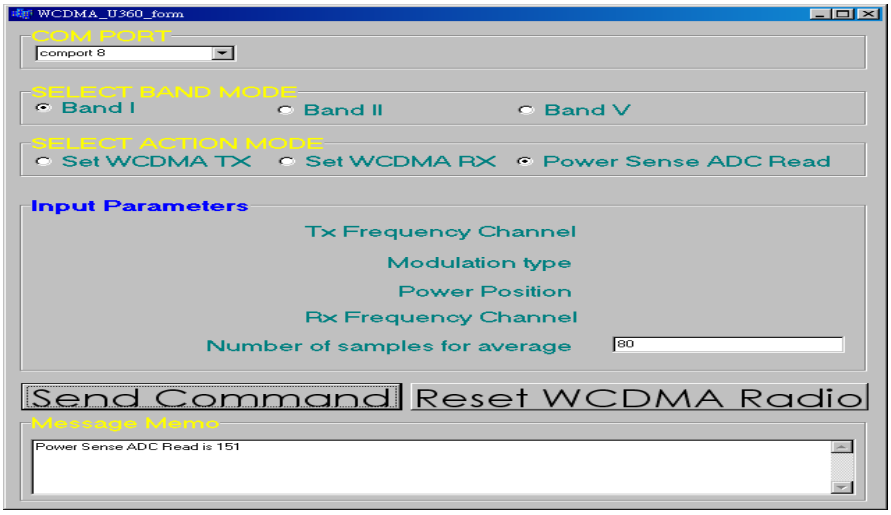
Set WCDMA RX



POWER Sense ADC Read



Result is showed as below



Step 5

Reset WCDMA Radio